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PHOTOFACT* Folder
*TRADE MARK

ADMIRAL
CHASSIS 14YP3B, BK, C

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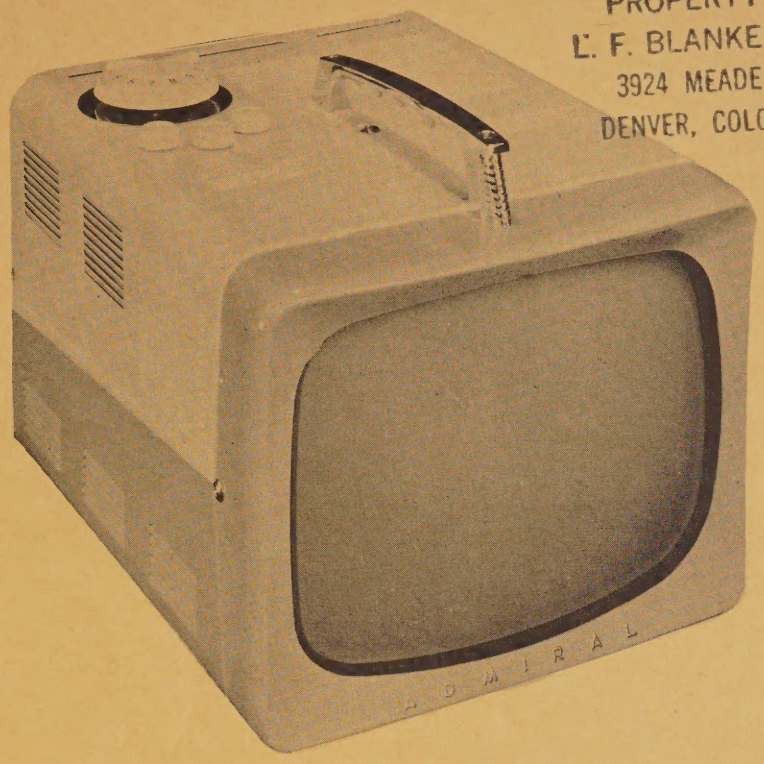

ADMIRAL MODEL T103 (Ch. 14YP3B)

TRADE NAME	Admiral	MODELS	CHASSIS
		T101, T102, T103, T104, T105AL, T106AL, T107AL, T1010, T1011AL, T1012AL, T1013AL	14YP3B, BK
		T140, T141, T142, T143, T144AL, T145AL, T1410	14YP3C
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois		
TYPE SET	Television Receiver		
TUBES	Fourteen		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 120 Watts 1.1 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13, Video IF 25.75MC, Sound IF 21.25MC (Intercarrier)		

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DATE 3-57 SET 350 FOLDER 1

ADMIRAL
CHASSIS 14YP3B, BK, C

RETMA MEMBER

ADMIRAL
CHASSIS 14YP3B, BK, C

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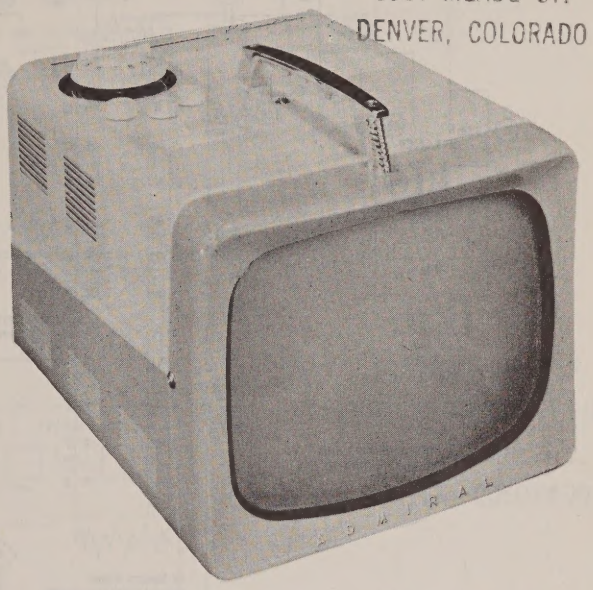
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 push-on type control knobs.
2. Remove 2 metal screws. Remove rear cover.
3. Remove 2 metal screws. Remove handle.
4. Remove 2 metal screws. Remove front and safety glass.
5. Remove 1 metal screw from top of cabinet.
6. Remove 6 chassis bolts from bottom of cabinet.
7. Remove chassis from front.
8. Remove 2 speaker leads.
9. Remove 2 metal screws. Remove speaker.



MODEL	CHASSIS
T103	14YP3B

ADMIRAL
CHASSIS 14YP3B, BK, C

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF tuner oscillator may be accomplished by removing channel selector, fine tuning knobs and escutcheon. The adjustments are accessible, one at a time as channels are changed. Adjust rear slug. Always adjust lowest channel first.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws holding front of cabinet. Using extreme caution, remove front of cabinet and safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

FOCUS

Focus may be varied by placement of strap between pins 6 and 2 or 6 and 10 of picture tube. Readjust ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjust horizontal hold until picture synchronizes horizontally.

FUSES

A 10Ω fusible resistor R83 is used for LV power supply protection.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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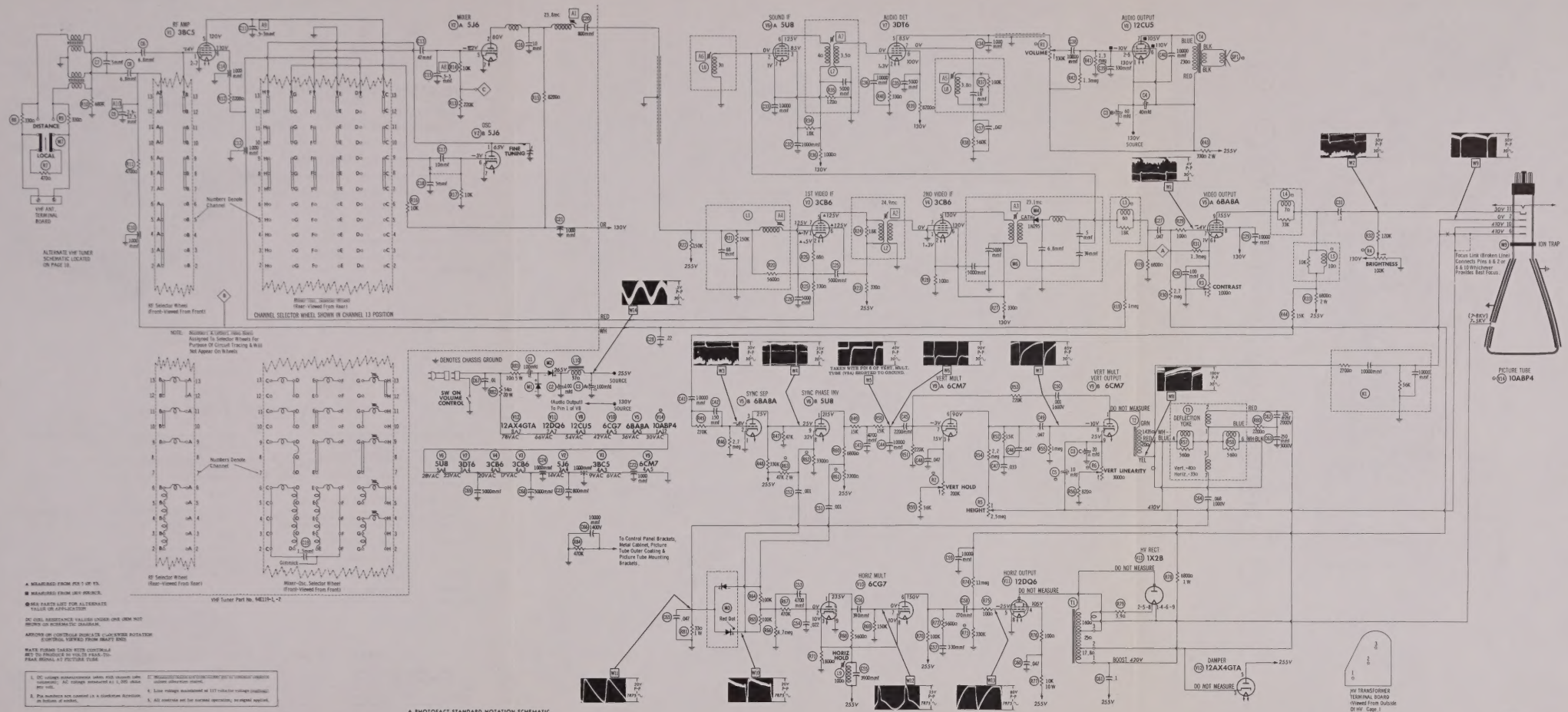

ADMIRAL
CHASSIS 14YP3B, BK, C

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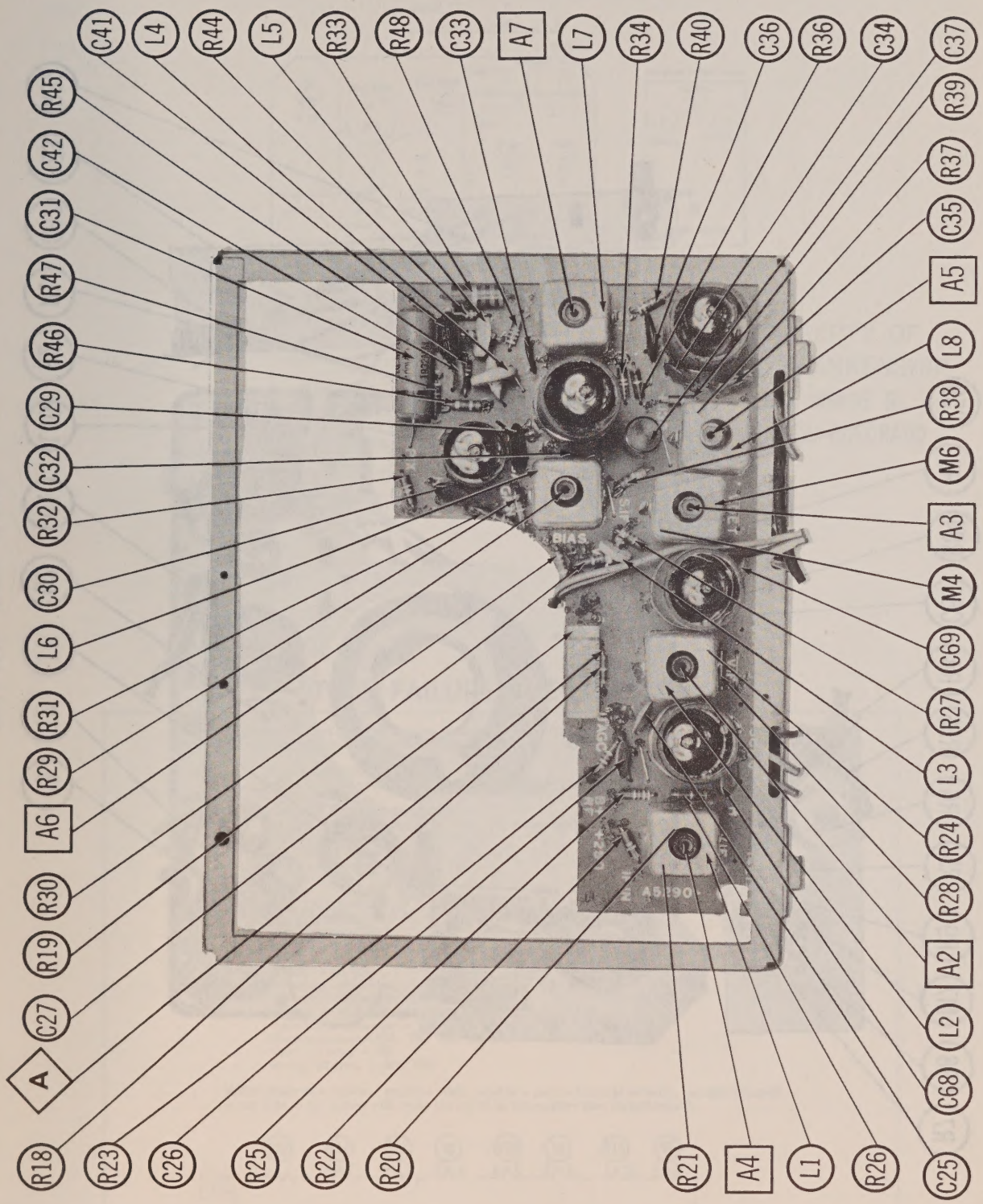

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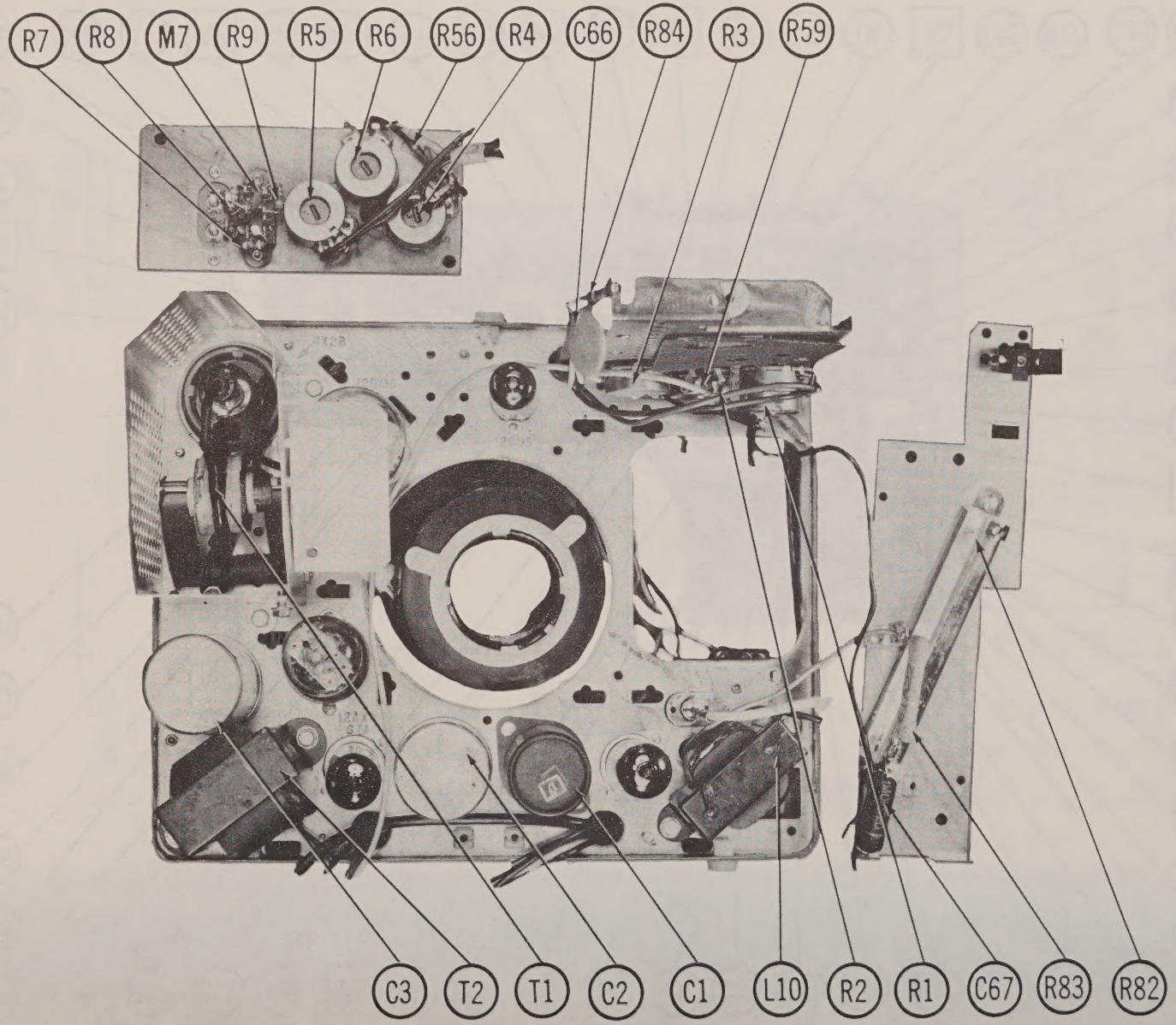
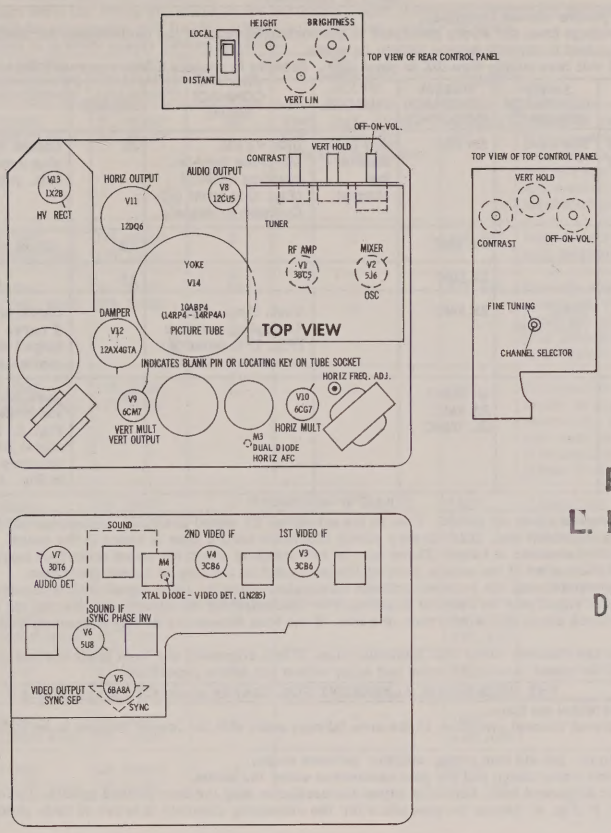
CHASSIS 14YP3B, BK, C

IF PRINTED BOARD



CHASSIS TOP VIEW

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

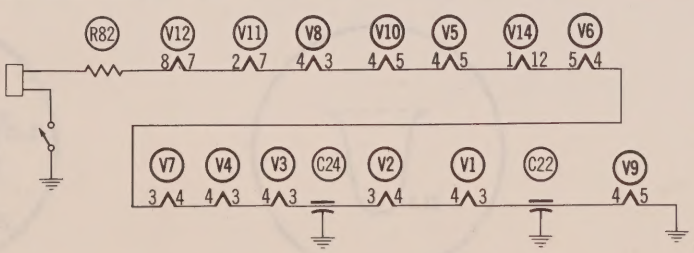
POWER SUPPLY FAILURE
No raster, no sound - Fusible Resistor (R83), Rectifier (M1) or (M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, Diode (M4), V8
No pic, no sound, has snow - V1, V2
No pic, has sound, has raster - V5, V14
Has pic, no sound - V6, V7, V8

SYNC FAILURE
No vert. sync - V5, V6, V9
No horiz. sync - V5, V6, Diode (M3), V10
No vert. or horiz. sync - V5, V6

SWEEP FAILURE
No raster, has sound - M3, V10, V11, V12, V13, V14
No vertical deflection - V9
Poor vert. linearity or foldover - V9
Poor horiz. linearity or foldover - V10, V11, V12
Narrow picture - V10, V11, V12, M1, M2
Vert. off freq. - V9
Horiz. off freq. - M3, V10

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative (See circuit below).



ADMIRAL
CHASSIS 14YP3B, BK, C

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Disconnect antenna and connect a jumper across terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide usable pattern on scope.
Connect the negative lead of a 2.5 volt bias supply thru 10K to point (B). Positive to chassis. Turn contrast fully counter clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V2). Low side to chassis.	Not used	23.8MC	Any non-interfering channel	USE VTVM. DC probe thru decoupling network (Fig. 1) to point (A). Common to chassis.	A1	Detune A4 by turning slug clockwise until slug extends approximately 1/8" out of coil. Adjust A1 for maximum deflection.
2.	"	"	"	24.9MC	"	"	A2	Adjust for maximum deflection.
3.	"	"	"	23.1MC	"	"	A3	"
4.	"	"	23MC (7MC Swp)	23.5MC	"	Vert. Amp. thru decoupling network (Fig. 1) to point (A). Low side to chassis.		Check for response curve similar to Fig. 2. If curve does not resemble Fig. 2 repeat steps 1 thru 3 for correct curve before continuing with step 5.
5.	"	"	"	21.25MC 23.5MC 25.75MC	"	"	A4	Turn A4 counter clockwise to reduce peak and broaden bandwidth of curve to resemble Fig. 3. It may be necessary to alternately adjust A4 and A1 to obtain proper curve with markers located as shown. The dotted line in Fig. 3 shows permissable variation.

SOUND IF ALIGNMENT

1. Turn the set on and allow 15 minutes warm-up period. Tune in the strongest TV signal available. Adjust the set for normal operation.
2. Using a non-metallic hexagonal alignment tool, turn A5 very slowly clockwise until a buzz is heard in the sound. Then turn counter clockwise until the loudest and clearest sound is heard. There may be two points at which the sound is loudest (approximately ½ turn apart). The slug should be set at the center of the second point of loudest sound as the slug is turned clockwise.
3. Using an attenuator between the antenna and the receiver antenna terminals reduce the input signal until a considerable amount of hiss and noise is heard in the sound. The signal may be reduced in strength by disconnecting the antenna and placing the lead near the terminals.
4. Carefully adjust A6 for the clearest sound with a minimum of noise. If the hiss disappears during alignment, reduce the signal still further until the hiss returns.
5. Carefully adjust A7 for loudest and clearest sound with minimum hiss. If this alignment has been made correctly, no further alignment should be necessary. However, if the sound is still distorted and noisy repeat the entire procedure.

VHF OSCILLATOR ALIGNMENT FOR TUNERS #94E119-1 AND #94E119-2

Turn the set on and allow 15 minute warm-up time.
1. Set the channel selector to the lowest channel operating in the area (always start with the lowest channel to be adjusted and the next higher, etc.).
2. Set the control for a normal picture. Set the fine tuning midway between stops.
3. Remove the channel selector, fine tuning knobs and the gold escutcheon under the knobs.
4. Using an 1/8" blade non-metallic alignment tool, carefully adjust the oscillator slug for best picture quality. (When two slugs are visible adjust the one marked REAR SLUG in Fig. 4) Repeat the procedure for the remaining channels in order of their channel number (from lowest channel to highest channel).

VHF OSCILLATOR ALIGNMENT FOR TUNER #94D128-1

Always make channel adjustments on the highest channel to be adjusted first since adjustment on one channel will affect adjustment of the lower channels. Before adjusting see Fig. 5 for location of channel adjustment screws. Adjust as follows:

1. Turn the set on and allow 15 minutes warm-up period.
2. Set the channel selector to the highest VHF channel to be adjusted and adjust the controls for normal picture.
3. Set the fine tuning control at the center of its range by turning in either direction two full turns then one quarter turn in the opposite direction.
4. Remove the channel selector, fine tuning knobs, and the escutcheon under knobs.
5. Using an 1/8" blade non-metallic alignment tool, carefully adjust for best picture. (Note that sound is not loudest at this point.) Repeat this procedure for remaining stations, in order of their channel numbers (starting with the highest channel and proceding to the lowest).

NOTE: If channel adjustment screws for channels 7 to 12 do not have sufficient range, make adjustments using channel 13 slug and then check adjustment of each of the lower channels. If the channel adjustment screws for channels 2 thru 5 do not have sufficient range, make adjustment using channel 6, then check each of the lower channels. If channel 6 or 13 is in operation, use next lower channel to extend adjustment range.

VHF RF AND MIXER ALIGNMENT FOR TUNERS #94E119-1 AND #94E119-2

Connect the negative lead of a 2.5 volt bias supply to point (B). Positive to chassis.
Set the local-distant switch to "Distant" position.
Turn the set on. Allow 15 minutes warm-up period.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	201MC (10MC Swp)	199.25MC 203.75MC	11	Vert. Amp. thru 15K to point (C). Low side to chassis.	A8, A9	Alternately adjust A8 and A9 to obtain response curve similar to Fig. 6 with markers as shown.
7.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A10	Adjust to obtain response curve similar to Fig. 6 with markers as shown. Check other channels using proper sweep and marker frequencies. If necessary retouch A8 and A9 for correcting high band channels and A10 for low band channels.

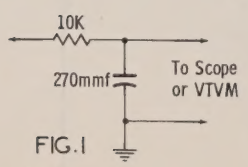


FIG. 1

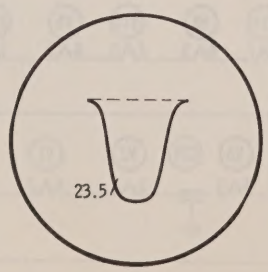


FIG. 2

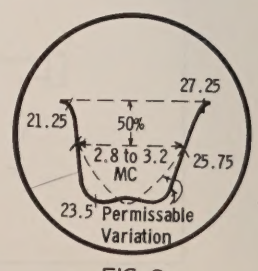


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT FOR TUNER #94D128-1

Connect the negative lead of a 3 volt bias supply to point Ⓑ. Positive to chassis.
Set the local-distant switch to "Distant" position.
Allow 15 minute warm-up period for receiver and test equipment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis.	A11, A12, A13	Check for response curve similar to Fig. 6. If necessary, adjust A11, A12 and A13 alternately to obtain proper response. A12 and A13 are adjusted for proper bandwidth and marker positions. A11 is adjusted for maximum amplitude.
9.	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"	A14, A15	Adjust for response curve similar to Fig. 6 with markers as indicated.
10.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"	A13, A16	Retouch A13 if necessary for proper response curve (Fig. 6). If bandwidth is too broad move lead (A16) away from mixer grid ground strap. If too narrow, move lead closer.
11.	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"	A17	If bandwidth is too broad move lead (A17) closer to capacitor body. If too narrow move away from capacitor. Check other high band channels using proper frequencies. If necessary, make compromise adjustments of steps 8 thru 11.
12.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	*A18, *A19, *A20	If required, alternately adjust coils by expanding or compressing coil turns to obtain proper response. Adjust coils whose "A" numbers are preceded by (*) for maximum amplitude. Adjust others for tilt and marker placement.
13.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	*A26, A22, A23	"
14.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	*A24, A25, A26	"
15.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	*A27, A28, A29	"
16.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	*A30, A31, A32	"

FIG. 4
VHF OSC ADJUSTMENTS

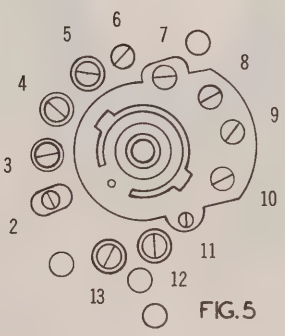


FIG. 5
VHF OSC ADJUSTMENTS

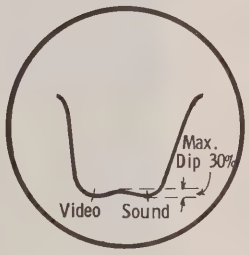
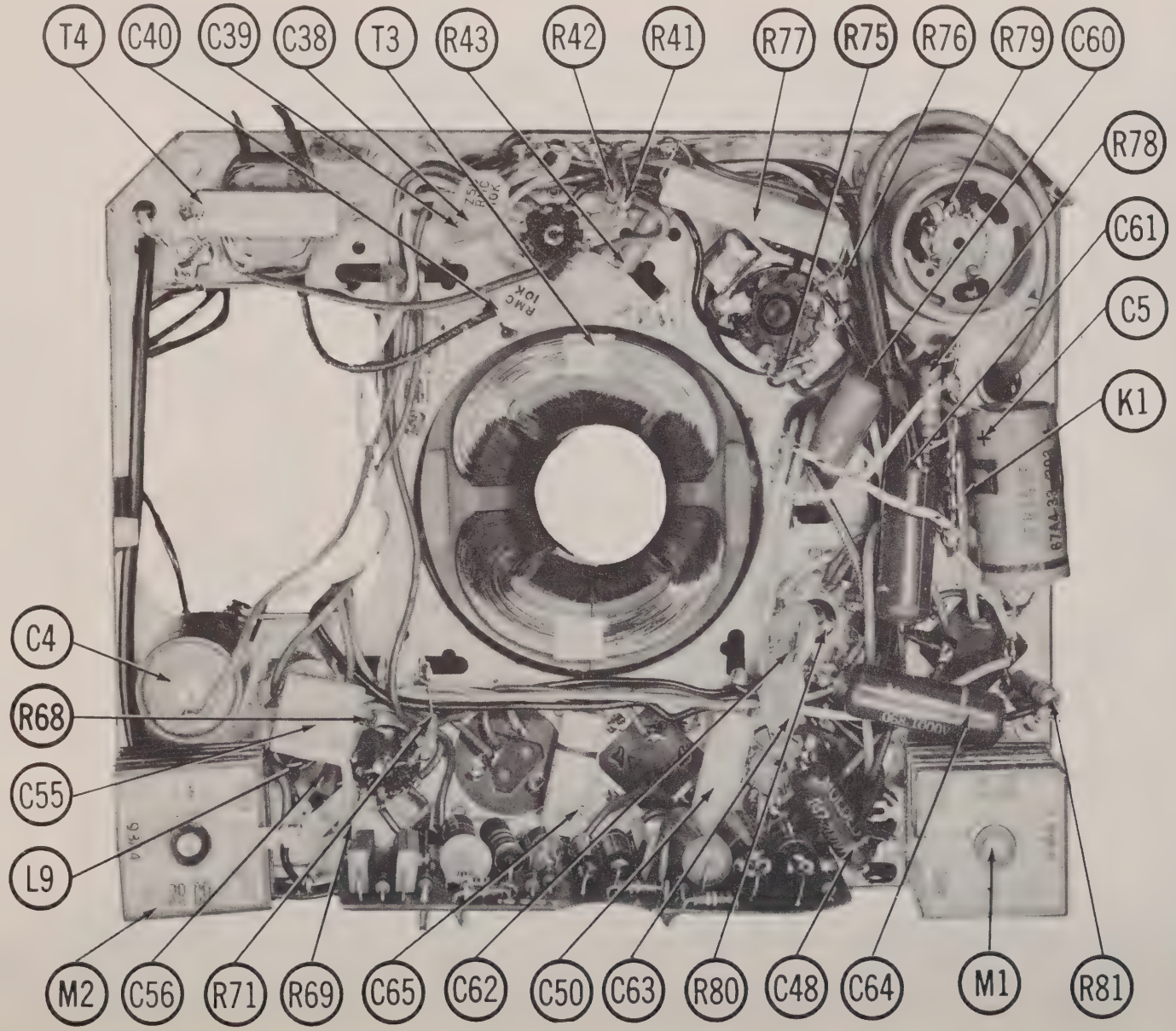
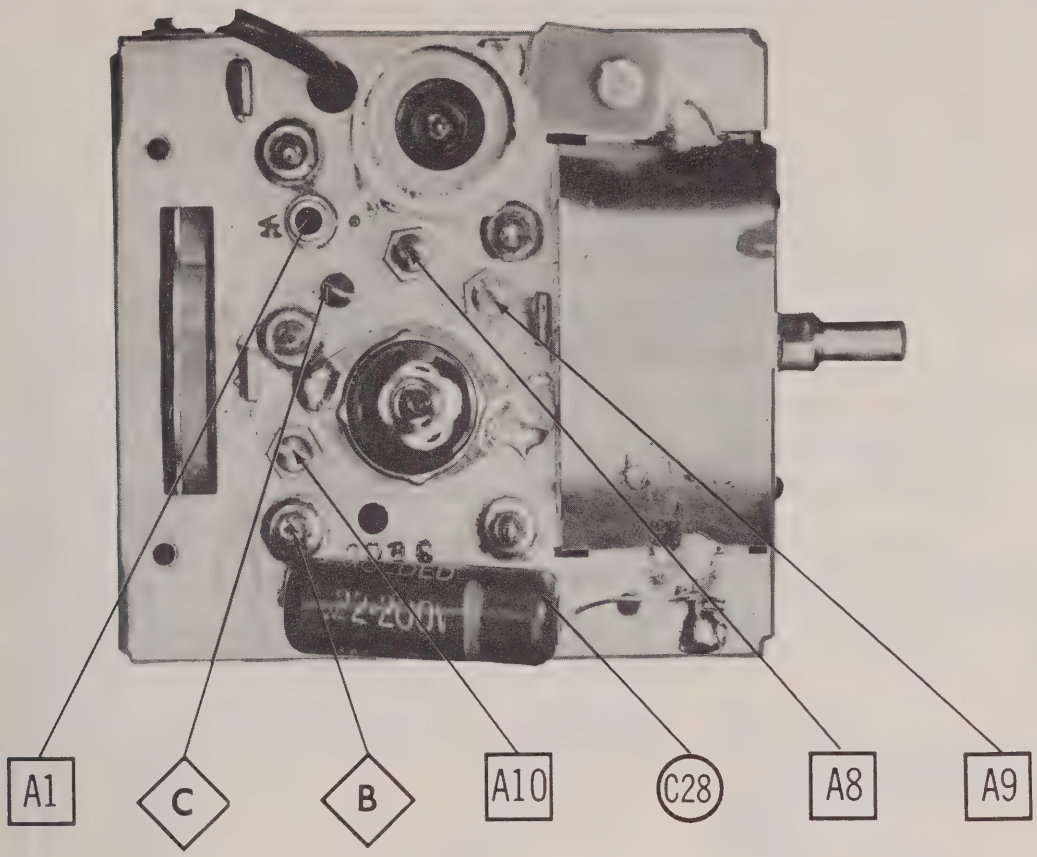


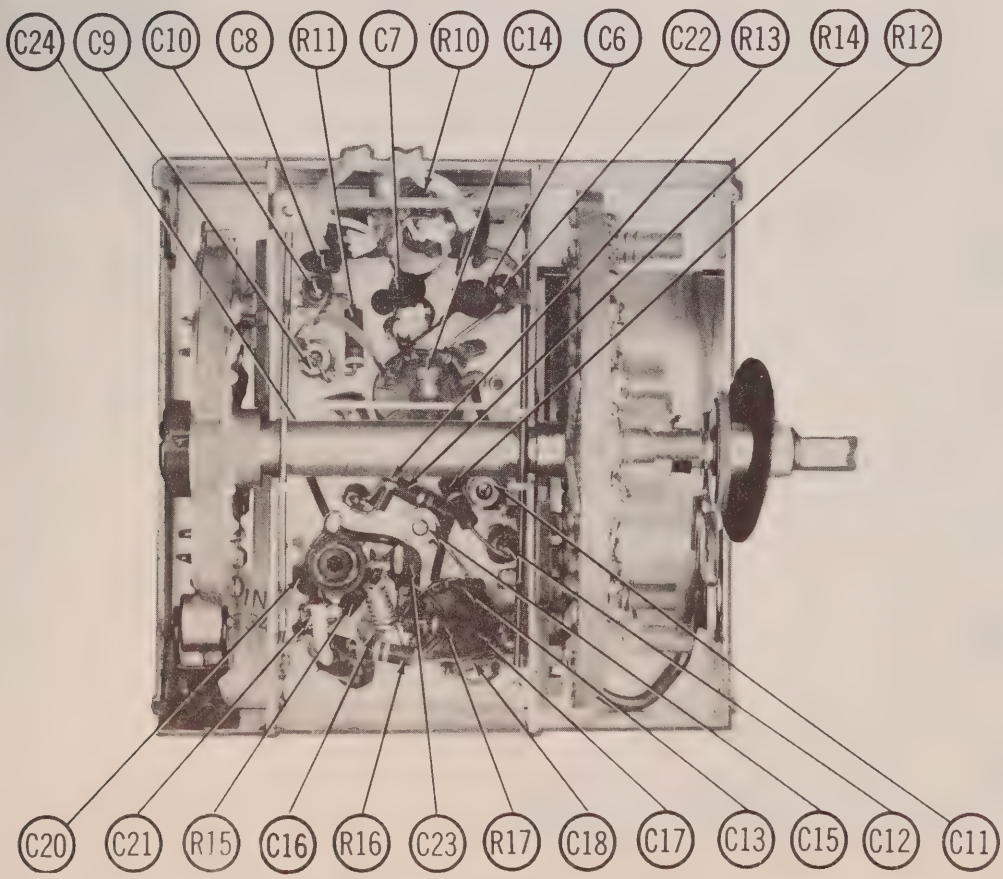
FIG. 6



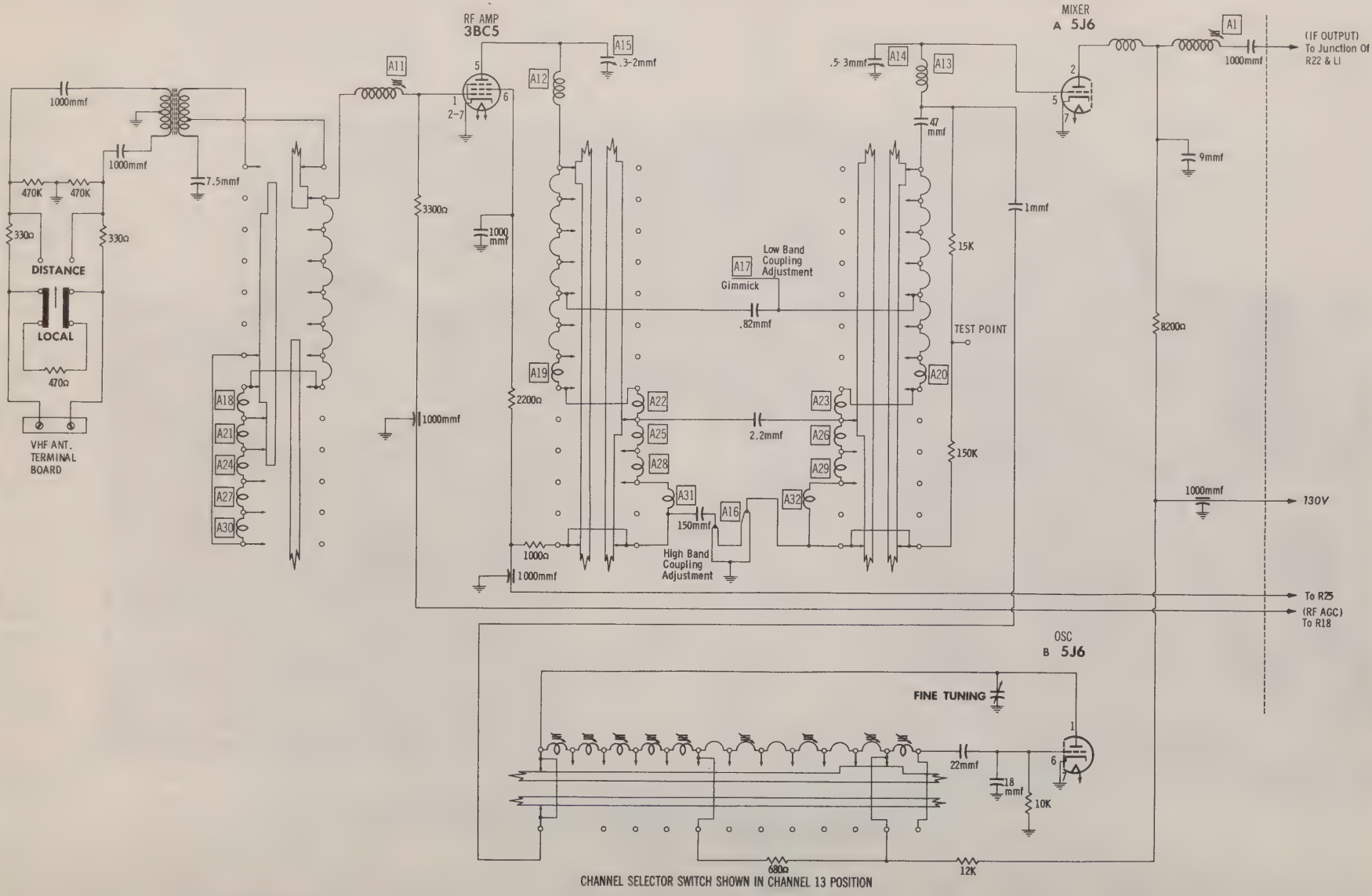
CHASSIS-BOTTOM VIEW



TUNER-TOP VIEW



TUNER-BOTTOM VIEW



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

VHF Tuner Part No. 94D128-1

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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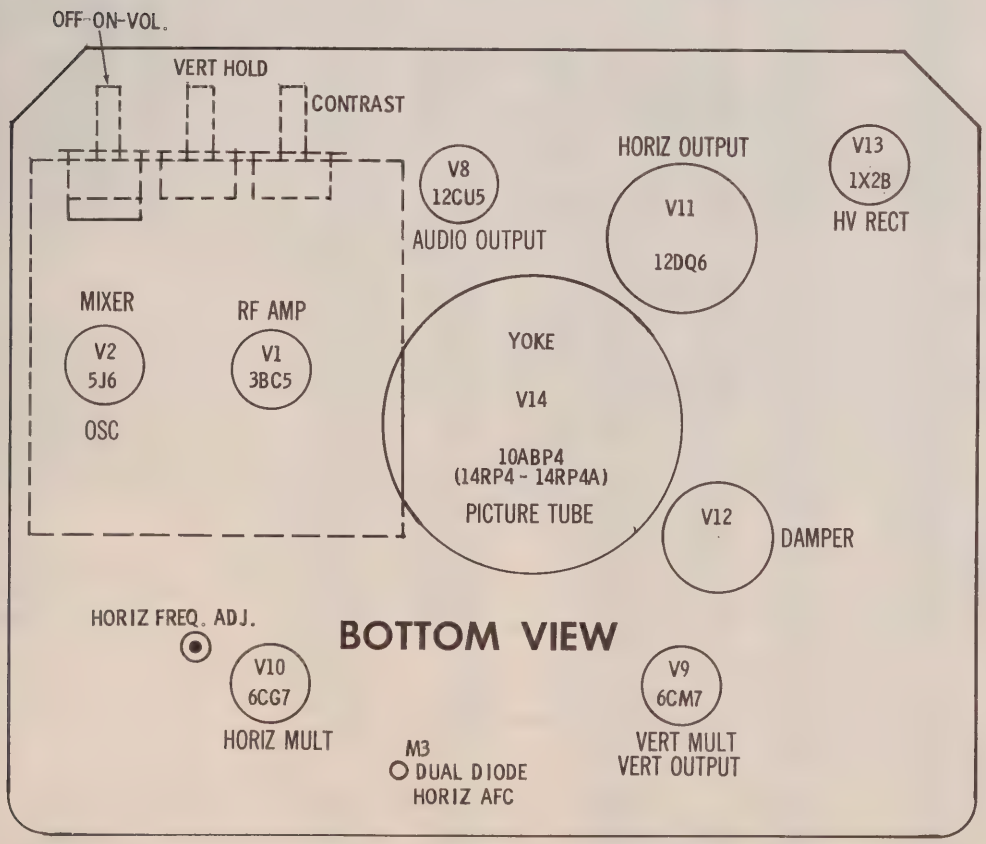
ALTERNATE VHF TUNER SCHEMATIC

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1Meg	0Ω	1.5Ω	2.2Ω	▲330Ω	▲2.5K	0Ω		
V2	5J6	■ 10K	■ 8200Ω	3.5Ω	2.2Ω	230K	10K	0Ω		
V3	3CB6	▲5600Ω	▲ 68Ω	3.5Ω	4.4Ω	† 330Ω	† 330Ω	70K		
V4	3CB6	.4Ω	100Ω	4.4Ω	5.2Ω	■ 330Ω	■ 330Ω	0Ω		
V5	6BA8A	0Ω	2.7Meg	† 330K	9Ω	8Ω	●150Ω	1.2Meg	100K	
V6	5U8	† 10K	3Ω	■ 20K	6Ω	7Ω	■ 1000Ω	120Ω	3300Ω	43K
V7	3DT6	3.5Ω	330Ω	6Ω	5.2Ω	† 330K	■ 8200Ω	560K		
V8	12CU5	100K	560K	10Ω	12Ω	560K	† 330Ω	† 560Ω		
V9	6CM7	‡7500Ω	NC	● 90K	1.5Ω	0Ω	● ‡2.5Meg	220K	1Meg	● 1900Ω
V10	6CG7	† 5600Ω	5.2Meg	1800Ω	10Ω	9Ω	† 100K	150K	1800Ω	0Ω
V11	12DQ6	NC	13.5Ω	TP	† 10K	330K	TP	12Ω	0Ω	TOP CAP ‡25Ω
V12	12AX4GTA	TP	TP	110K	NC	57Ω	TP	13.5Ω	15Ω	
V13	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡185Ω
V14	10ABP4	8Ω	56K	Pin 6 56K	Pin 10 ‡6800Ω	Pin 11 ■ 200K	Pin 12 7Ω			

† MEASURED FROM OUTPUT OF M2.
■ THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 7 OF V3.
‡ MEASURED FROM PIN 3 OF V12.
■ MEASURED FROM 130V SOURCE.
NC NO CONNECTION
TP TIE POINT

PROPERTY OF
E. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



TUBE PLACEMENT CHART

SET 350 FOLDER 1

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	3BC5	
V2	Mixer-Oscillator	3J6	
V3	1st Video IF Amplifier	3CB6	
V4	2nd Video IF Amplifier	3CB6	
V5	Video Output-Sync Sep.	6BA8A	
V6	Sound IF Amp. Sync Phase Inverter	6U8	
V7	Audio Detector	3DT6	
V8	Audio Output	3BC5	
V9	Vert. Mult.-Vert. Output	6CM7	
V10	Horiz. Mult.	6CG7	
V11	Horiz. Output	12DQ6	
V12	Damper	12A3/6GT6	
V13	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	ADMIRAL PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V14	10A/B4			10A/B24B	① Aluminized
	14H4		14H4	14H4	② Silver Screen 85
	14H4A		14H4A ②	14H4A ②	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP	VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	NOTES
C1	100	150	67D45-183	A15S1-27	AA0241	FPJ16	TM3-23	D-070	TVL-1423	
C2	100	300	67D43-234	AFH50-1-6-05	DQ5R6	FPJ38 & TC65			TVL-2576	
C3A	40.00	300	67D45-136	AFH4-1-4-40		FF335		T-378	R2367 †	
B	40.00	150								
C	20	50								
C4	40	300	67A35-3	PRS350V40	BR4035	TC54	TD-40-350	FM-3540	TVA-151J	
C5	10	475	67A4-23 (Note 1)	PRS500V10	BR1350	TC52	TD-10-500	MT-4710	TVA-1802	

Note 1: A 10X2FD @ 500V (Part #67A4-34) may be used in some versions.
† Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP	VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	6.8		65ZD0-218	MP0-.68-.8	C10Y68C	TCO-6.8	Z7-5568	Z7-5568	5TCCB-V68	
C7	5		65ZD0-108	MP0-.015	TCC-.68T	C10Y5C	TCC-5	Z7-515	5TCCB-V	
C8	6.8		65ZD0-218	MP0-.68-.8	TCC-.68T	C10Y68C	TCC-6.8	Z7-5568	5TCCB-V68	
C9	2.5-.2.5		66A38-5							
C10	1000		66ZB0-5	KF-001	MPT-1000		31S-D	C7-565A	503C-D1	
C11	.1-.3		66A38-5		839-3					
C12	1000		66ZB0-5	KF-001	MPT-1000		31S-D	C7-565A	503C-D1	
C13	1000		66ZB0-5							
C14	1000		65ZB0-5	KF-001	MPT-1000		31S-D	C7-565A	503C-D1	
C15	1.5-3		66A38-6		839-3					
C16	10		65D00-66	NT50-S1 10	TCN-10	C10Q1U	TCT-10	NT-541	5TCU-Q1	
C17	10		65ZD0-50	NT50-S1 10	TCN-10	C10Q1U	TCT-10	NT-541	5TCU-Q1	
C18	5		65ZK0-23	NT50-S15	TCN-5	C10Y5U	TCT-5	NT-558	5TCU-Y5	
C19	1.5		65ZS3-015	NT50-S1 1.5	TCC-1R5	C10Y1R5C	TCC-1.5	ZT-5515	5TCCB-Y15	
C20	500		66ZM0-500	BPD-0008	BD-501	L10T8			5GA-T8	
C21	1000		65ZB0-5	KF-001	MPT-1000		KD-1000		503C-D1	
C22	1000		65ZB0-5	KF-001	MPT-1000		ED-1000		503C-D1	
C23	500		66ZM0-500	BPD-0008	ED-501	L10T8			5GA-T8	
C24	1000		65ZB0-5	KF-001	MPT-1000				503C-D1	
C25	1000		65ZM0-5	BPD-005	ED-503	HYA10D5	GP-5000	DC535	5HK-D5	
C26	5000		65ZM0-5	BPD-005	ED-503	HYA10D5	GP-5000	DC535	5HK-D5	
C27	.047	300	59C38-59	BPD-08	BD-503	CUSB347		GEM-3147	2TM-B47	
C28	.33	300	64C38-33	P38N-33		CUSB233		GEM-3133	2TM-P22	
C29	1000		65ZM0-5	BPD-05	ED-501	HYA10D5		DC531	5HK-D5	
C30	100		59C44-15	MP0-.01 100	TCS-100	C10T1C	TCO-100	ZT-531	5TCC-T1	
C31	.1	600	64C33-33	94H5S-1		DF-104		47M-D1	47M-P1	
C32	1000		65ZB0-001	BPD-001	BD-503	HYA6D1	KD-1000	DC531	5HK-D1	
C33	10000		59C44-3	BPD-01	BD-503	HYA6S1	GP-10000	DC531	5HK-D1	
C34	1000		65ZS0-53	BPD-001	BD-503	HYA6D1	KD-1000	DC531	5HK-D1	
C35	5000		65ZK0-5	BPD-005	BD-503	HYA10D6	GP-5000	DC535	5HK-D5	
C36	10000		59C44-3	BPD-01	BD-503	HYA6S1	GP-10000	DC531	5TM-S47	
C37	.047	300	64H5S-55	BPD-08	BD-501	BC3S47		GEM-3147	2SK-S47	
C38	10000		65ZK0-3	BPD-01	BD-503	HYA6S1	GP-10000	DC531	5HK-S1	
C39	390		65ZS0-315	BPD-00033	BD-331	L10T33	KD-330	UC-5333	5GA-T33	
C40	10000		65ZK0-3	BPD-01	BD-503	HYA6S1	GP-10000	DC531	5HK-S1	
C41	10000		59C44-3	BPD-01	BD-503	HYA6S1	GP-10000	DC531	5HK-S1	
C42	150		59C44-9	MT50-D1 150	TCS-150	L10T15	TC7-150		5TCU-T15	
C43	4700		65ZM0-123	D1-0047	BD-473	HYA10D47	GP-4700	UC-5247	5HK-D47	
C44	1000		59C44-3	D1-01		HYA6S1	GP-10000	DC531	5HK-S1	
C45	2200		65ZK0-11	D1-0022		HYA10Z22	GP-2200	UC-5222	5GA-T22	
C46	.047	600	59C38-47	BPD-06	DF-503	CUSB647		GEM-4147	47M-B47	
C47	.033	600	59C38-35	BPD-03	DF-303	CUSB633		GEM-4133	47M-S33	
C48	.047	300	59C38-47	BPD-06	DF-503	CUSB347		GEM-3147	2TM-B47	
C49	.047	600	59C38-9	BPD-06	DF-503	CUSB647		GEM-6147	47M-B47	
C50	.001	1600	64A3-35	BPD-001	DF-103	CUSB2D1		GEM-4131	47M-D1	
C51	.001	600	64A3-35	BPD-001	DF-103	CUSB4D1		GEM-4131	47M-D1	
C52	.001	600	64C38-30	BPD-001	DF-103	CUSB4D1		GEM-4131	47M-D1	
C53	.047		65C44-31	D1-0047	BD-473	HYA10D47	GP-4700	UC-5247	5HK-D47	
C54	.022	300	59C38-98	BPD-03		CUSB322		GEM-3122	2TM-S22	
C55	1900		65ZB0-1902	149T-D039		5N1D39			MS-239	
C56	390		65ZS3-391	1466-00039		1R5T39			5EE-S39	
C57	330		65ZS3-331	1464-00033		1R5T33			MS-233	
C58	270		65ZS3-271	1466-00027		1R5T27			MS-327	
C59	10000		65ZK0-41	BPD-01	BD-103	HYA6S1	GP-10000	DC531	5HK-S1	
C60	.047	600	64C38-34	BPD-05	DF-503	CUSB647		GEM-4147	47M-B47	
C61	.1	600	64C33-7			P6B6N-1		GEM-601	47M-P1	
C62	335	3000	65ZK0-115							
C63	330	3000	65ZK0-114							
C64	.086	1000	64A3-34	P10S6N-068			CUSB1068		GEM-10168	10TM-S68
C65	.047	300	64C38-59	BPD-05		BD-503	CUSB347		GEM-2147	2TM-B47
C66	10000	1400	65ZS0-85	DAC-37		DD16-105	CUSB5I		GEM-1161	BL-B10
C67	.01	600	64A2-35	BPD-01		BD-103	CUSB5I		GEM-61	47M-S1
C68	5000		65C44-1	BPD-005		BD-503	HYA10D5	GP-5000	DC535	5HK-D5
C69	5000		65C44-1	BPD-005		BD-503	HYA10D5	GP-10000	DC535	5HK-D5

CONTROLS

ITEM No.	RATING RESIST ANCE	WATTS	REPLACEMENT DATA ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	330K	½	73C1-77 ①		A47-500K-2	Q13-132	U48	Volume
B	Shaft				KS3-3	Not Req.	Not Req.	
C	Switch					SWE-12	10-215	
R2A	200K	½	73C20-45 ②	AB-46	A47-200K-3	Q11-129	U43	Vertical Hold
B	Shaft			AK-4	KS6-3	Not Req.	Not Req.	
R3A	100K	½	73C13-76 ③	AB-506		Q17-108	U3	Contrast
B	Shaft			AK-4		Not Req.	Not Req.	
R4A	100K	½	73C20-64 ④	AB-40		Q11-128	2TA21L	Brightness
B	Shaft			AK-19		TQ	Not Req.	
R5A	2.5Meg	½	73C20-61	AB-52		Q11-239	SU-565	Height
B	Shaft			AK-19		TQ	Not Req.	Vertical Linearity
R6A	3000Ω	½	73C20-40 ⑤	AB-8		Q11-12	SU-8	
B	Shaft			AK-16		TQ	Not Req.	

① Part #75C1-81 used in chassis 14YP3C.
② Alternate part #75C13-77 used in chassis 14YP3B, BK; Part #75C13-78 used in chassis 14YP3C.
③ Part #75C13-78 used in chassis 14YP3C.
④ Alternate part #75C20-43.
⑤ Alternate part #75C20-43.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R7	470Ω		60B8-471	BTS-470	
R8	330Ω		60B8-331	BTS-330	
R9	330Ω		60B8-331	BTS-330	
R10	680K		60B8-684	BTS-680K	
R11	470Ω		60B8-472	BTS-4700	
R12	2200Ω		60B8-222	BTS-2200	
R13	220K		60B8-224	BTS-220K	
R14	10K		60B8-103	BTS-10K	
R15	82000	5%	60B7-823	BTS-8200 5%	
R16	10K		60B8-103	BTS-10K	
R17	10K		60B8-103	BTS-10K	
R18	1Meg		60B8-105	BTS-1Meg	
R19	6800Ω		60B8-682	BTS-6800	
R20	560Ω		60B8-562		
R21	150K	5%	60B7-154	BTS-150K	
R22	150K	5%	60B7-154		
R23	330Ω	5%	60B7-331	BTS-330 5%	
R24	18K	5%	60B7-183		
R25	330Ω		60B8-331		
R26	68Ω		60B28-44	BTS-68	
R27	330Ω		60B8-331	BTS-330	
R28	100Ω		60B8-101	BTS-100	
R29	100Ω		60B8-101	BTS-100	
R30	2.7Meg		60B8-275	BTS-2.7Meg	
R31	1.3Meg	5%	60B7-135	BTS-1.3Meg 5%	
R32	130K	5%	60B7-134	BTS-130K	
R33	6800Ω	5	60B20-682	BTS-6800	
R34	18K		60B8-183	BTS-18K	
R35	130Ω		60B8-131	BTS-130	
R36	100Ω		60B8-101	BTS-1000	
R37	100K		60B8-104	BTS-100K	Note 1
R38	560K		60B8-564	BTS-560K	
R39	6200Ω		60B8-622	BTS-6200	
R40	3300Ω	5%	60B8-332	BTS-3300	
R41	1.3Meg	5%	60B7-135	BTS-1.3Meg 5%	
R43	1.3Meg	5%	60B7-135	BTS-1.3Meg 5%	
R43	330Ω	3	60B20-331	BTS-330	
R44	15K		60B8-153	BTS-15K	
R45	270K		60B8-274	BTS-270K	

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R46	2.7Meg		60B8-275	BTS-2.7Meg	
R47	47K		60B8-473	BTS-47K	
R48	330K		60B8-334	BTS-330K	
R49	15K		60B8-153	BTS-15K	
R50	15K		60B8-153	BTS-15K	
R51	220K		60B8-224	BTS-220K	
R53	15K		60B8-153	BTS-15K	
R53	220K		60B8-224	BTS-220K	
R54	2.5Meg		60B8-254	BTS-2.5Meg	
R55	1Meg		60B8-105	BTS-1Meg	
R56	820Ω		60B8-821	BTS-820	
R57	820Ω		60B8-821		
R58	560Ω		60B8-561		
R59	56K		60B8-563	BTS-56K	
R60	6800Ω		60B8-682		
R61	3300Ω		60B8-333		
R62	330Ω		60B8-331		
R63	47K	3	60B20-473		
R64	100K	5%	60B7-104		
R65	100K	5%	60B7-104		
R66	4.7Meg		60B8-475		
R67	470K		60B8-474		
R68	5600Ω		60B8-562		
R69	100K		60B8-104		
R70	100K		60B8-104		
R71	1600Ω		60B8-162		
R72	5800Ω		60B8-562		
R73	330K		60B8-334		
R74	1Meg	5%	60B7-105		
R75	100Ω		60B8-101	BTS-100	
R76	100Ω		60B8-101	BTS-100	
R77	10K	10	61B20-3	PW10-10K	
R78	6800Ω	1	63B14-682	HTA-6800	
R79	3.3Ω		63B33-53	SW3-3.9	
R80	3300Ω		63B22-222	BTS-2200	
R81	33Ω	1	63B14-330	HTA-33	
R82	54Ω	20	63B33-27		
R83	10Ω	5	61A-33	PWT-10	
R84	470K		60B8-474	BTS-470	

Note 1: Not used in early production versions.
Note 2: A 470Ω (part #60B8-472) used in early production versions.
Note 3: A 56K (Part #60B8-339) used in early production versions.
Note 4: A 470K (Part #60B8-474) used in early production versions.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Horiz. Output Trans.	79B70-1				HO-365*		
T2	Vert. Output Trans.	79B71-1						
T3A	Yoke(90°)Horiz(19MZ)	94D47-1 ①						
B	Vert(33MH)							

① Does not include yoke rear cover and centering device.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
1				3			
2					2		
3				2			
4					1		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	2800Ω	3-4Ω	79D33-13	Z1165 ②	A-5025	A-3333	25D48 ①	S-13X	① Drill one new mtg. hole. ② Do not use taps on primary winding.

SPEAKER

ITEM No.	TYPE SIZE	FIELD V C IMP.	REPLACEMENT DATA ADMIRAL PART No.	QUAM PART No.	NOTES
SP1	3½	PM 3-4Ω	76B120-1 ① ②	3A07	① Alternate part #76B120.
		PM 3-4Ω	76B122-1 ③		② Used in chassis 14YP3B, BK.
					③ Used in chassis 14YP3C.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	1st Video IF	73C132-17				
L2	2nd Video IF	73C132-6				
L3	Series Peaking Coil	73B5-33 ①	19-3160 ②	TV-184 ③	6180 ④	18K Microhenries-Wound on 18K resistor.
L4	Series Peaking Coil	73B5-32 ①	19-3236 ②	TV-186 ③	6130 ④	27Ω Microhenries-Wound on 33K resistor.
L5	Shunt Peaking Coil	73B5-31 ①	19-4400 ②	TV-190 ③	6134 ④	37Ω Microhenries-Wound on 10K resistor.
L6	4.5MC Coil	73C132-20				
L7	Sound IF	73C132-19				
L8	Quadrature Coil	73C132-18				

• Parallel with 18K resistor.
• Parallel with 33K resistor.
• Parallel with 10K resistor.
① Alternate part #73B5-8 used in later versions. Wound on 22K resistor.
② Alternate part #73B23-9 used in later versions.
③ Alternate part #73B41-1 used in later versions.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC SEC. PRI.	SEC.	REPLACEMENT DATA ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L9	100Ω		94C17-7	19-1578	TV-183	6310			25S-5	

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE @ CURRENT	REPLACEMENT DATA ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L10	.150A	57Ω	4.43H	76B18-18	C-9040	C-3994	C-3337	28C41	C-9JX ①

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ADMIRAL PART No	REPLACEMENT DATA	
E1	Vertical Blanking	10000MMMF, 10000MMF, 2700Ω 5800Ω	63C6-13	Aerovox Sprague	PA-323 103C13

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA ADMIRAL PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.
M1	.150A	93A4-3 ①	1N90S ②	1N90S ①	RS300L ①	6G300 ①	6Q4 ①	300 ①
M2	.150A	93A4-2 ①	1N90A ②	1N606 ①	RS306L ①	6S300 ①	6Q4 ①	300 ①
M3		13A5-2 ①	1N1 ②		1N1 ①			

① Selenium type.
② Germanium type.
③ 2 required.

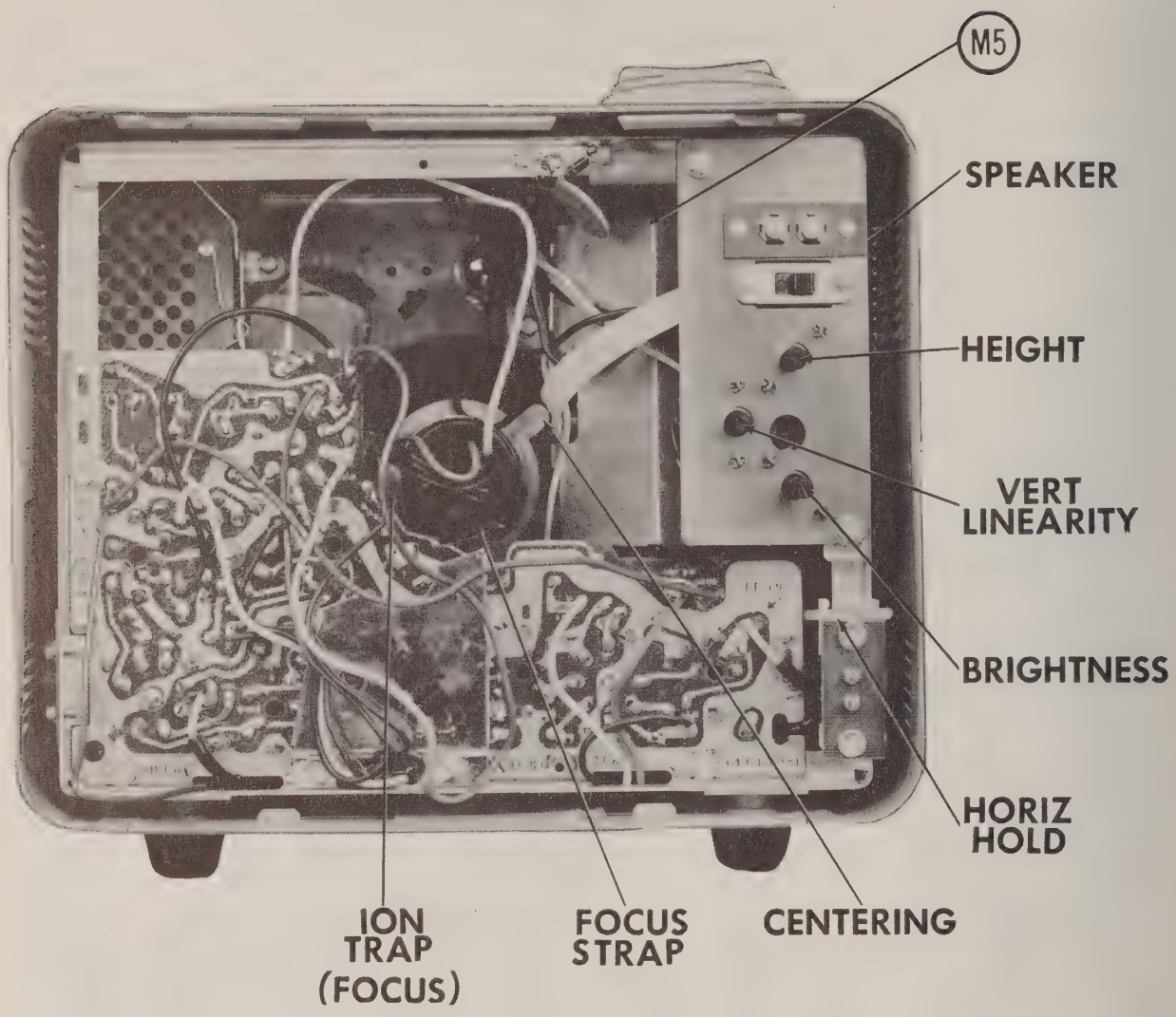
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA ADMIRAL PART No.	SYLVANIA PART No.	NOTES
M4	1N295		1N60	Video Detector

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M5	Tuner	94H19-1	Used in Chassis 14YP3B.
	Tuner	94D28-1	Used in Chassis 14YP3BK.
	Tuner	94H18-3	Used in Chassis 14YP3C.
M6	Video Det. Ass'y.	72C17-3	Includes Coils, Caps. and M4.
M7	Switch	77B32-3	Local-Distant, (Slide Type, DPDT)
M8	Centering Device	94A16-1	
M9	Ion Trap	94A18-2	Alternate part #94B18-5.
	Printed Board	A5290	Video IF, Includes All Components Except Tubes.
	Printed Board	A5291	Sync & Sweep, Includes All Components Except Tubes.
	Handle	57C141-3	Model T160.
	Handle	57C141-1	Models T141, T142, T143, T161, T163, T164.
	Handle	57C141-2	Models T144A1, T145A1, T105A1, T106A1, T107A1.
	Knob	53D203-51	Channel Selector, Models T160, T161, T161.
	Knob	53D203-11	Channel Selector, Models T101A1, T102A1, T103A1.
	Knob	53D203-33	Channel Selector, Models T142, T143, T145, T105, T103, T104.
	Knob	53D203-32	Channel Selector, Models T144A1, T145A1, T105A1, T106A1, T107A1.
	Knob	53D203-14	Fine Tuning, Models T101, T160, T141, T101.
	Knob	53D202-15	Fine Tuning, Models T101A1, T101A1, T103A1, T142, T143, T144A1, T145A1, T140, T102, T103, T104, T105A1, T106A1, T107A1.
	Knob	53A175-2	Control (3 used), Models T105, T140, T141, T101.
	Knob	53A175-4	Control (3 used), Models T101A1, T102A1, T103A1, T144A1, T145A1, T105A1, T106A1, T107A1.
	Knob	53A175-5	Control (3 used), Models T143, T145, T141G, T102, T103, T104.
	Safety Glass	21D88-1	Model T101.
	Safety Glass	21D88-2	Models T102, T103, T104, T105A1, T106A1, T107A1, T1010, T101A1, T102A1, T103A1.
	Safety Glass	21D90-1	Models T140, T141, T1410.
	Safety Glass	21D90-2	Models T142, T143, T144A1, T145A1.

ADMIRAL
CHASSIS 14YP3B, BK, C



CABINET—REAR VIEW

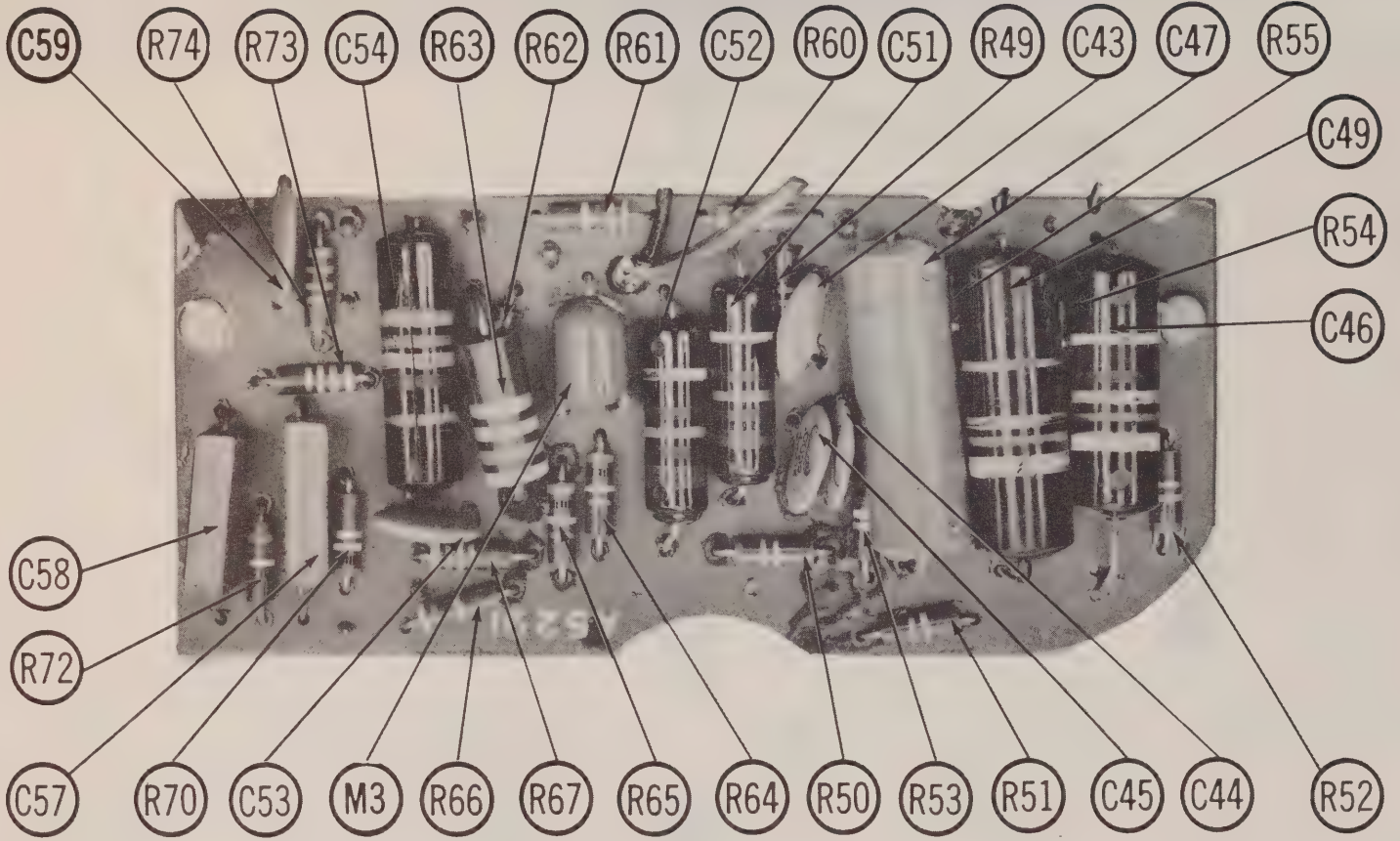
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the brightness and contrast controls for a normal picture.

Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.



SWEEP & SYNC PRINTED BOARD

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DENVER, COLORADO

AIRLINE
MODEL GEN-1090A

TRADE NAME	Airline Model GEN-1090A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Battery Operated Portable AM Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amplifier, 1U5 Det-AVC-AF Amp., 3V4 Output
POWER SUPPLY	1.5 Volts "A" Supply & 67.5 Volts "B" Supply RATING 245MA@1.5 Volts DC & 7MA@ 67.5 Volts DC
TUNING RANGE—BROADCAST	535KC - 1640KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.02MFD	High side to pin 6 (grid) of 1R5 (V1). Low side thru .02MFD to chassis.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1640KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal.	"	A5	"

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5	
V2	IF Amplifier	1U4	
V3	Det-AVC-AF Amp.	1U5	
V4	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	10	100	E3212	SRE150V10	BBR10-150	TC42			

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	200		BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C3	2000			BPD-002	D6-202	K072	GP-2000	DC522	5HK-D2	
C4	100			BPD-0001	D6-101	G042	ED-100	UC-531	5GA-T1	
C5	10000			BPD-01	D6-103	K082	GP-10000	DC511	5HK-S1	
C6	2000			BPD-002	DD-202	K072	ED-002	DC522	5HK-D2	
C7	2000			BPD-002	D6-202	K072	GP-2000	DC522	5HK-D2	
C8	2200		E3322	BPD-0022	D6-222	K073	GP-2200	UC-5222	5HK-D22	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500K	½	E2517					Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

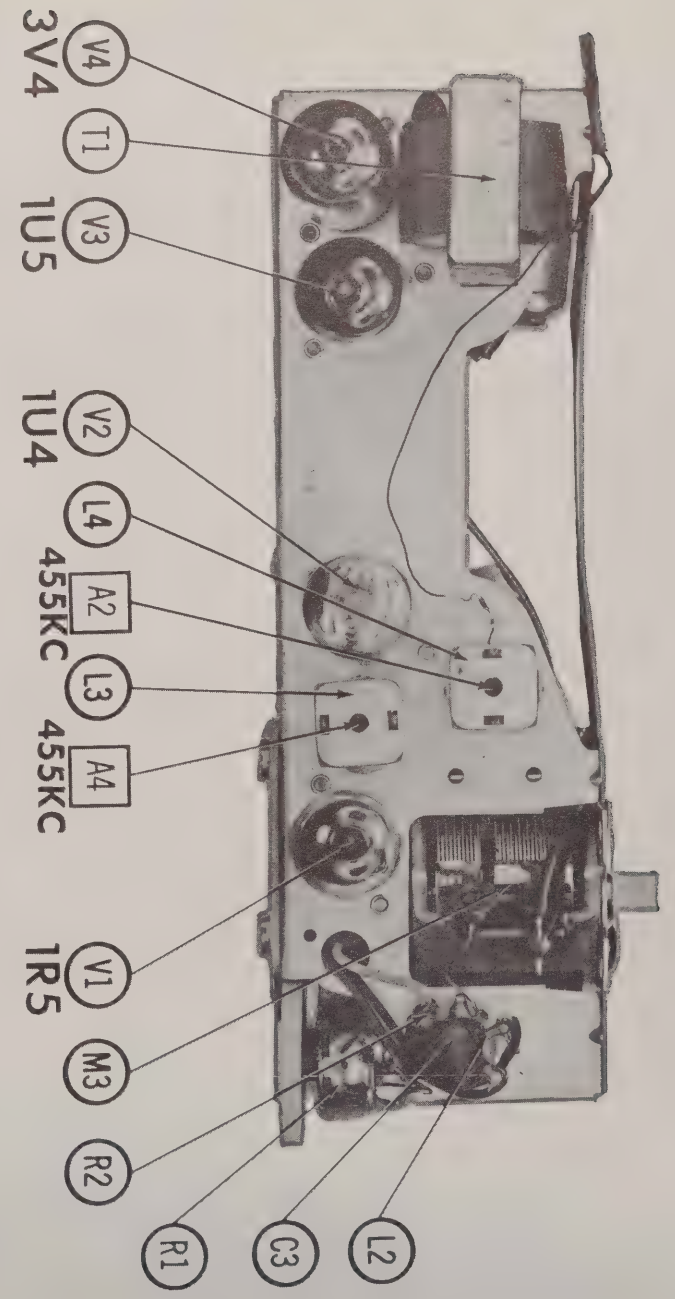
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRLINE PART No.	IRC PART No.	
R2	100K			BTS-100K	
R3	15K			BTS-15K	
R4	3.3Meg			BTS-3.3Meg	
R5	10Meg			BTS-10Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRLINE PART No.	IRC PART No.	
R6	1Meg			BTS-1Meg	
R7	4.7Meg			BTS-4.7Meg	
R8	1Meg			BTS-1Meg	
R9	390Ω			BTS-390	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	8400Ω	3-4Ω	E1112		A-2927	A-3329①	24S49 ①	S-8X ①	① Use original channel mtg. frame.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	E1016	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		AIRLINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	E6014				
L2	Osc. Coil	E6126			69-Osc.	
L3	Input IF	E6211	16-6800	BC-357	10-C1	
L4	Output IF	E6211	16-6801	BC-358	10-C2	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No.	REPLACEMENT DATA	
K1	Diode Filter	150MMF, 150MMF, 47K		Aerovox	PA98
				Centralab	PC-51
				Cornell-Dubilier	111TM2
				Erie	1403-02
				Sprague	D-2

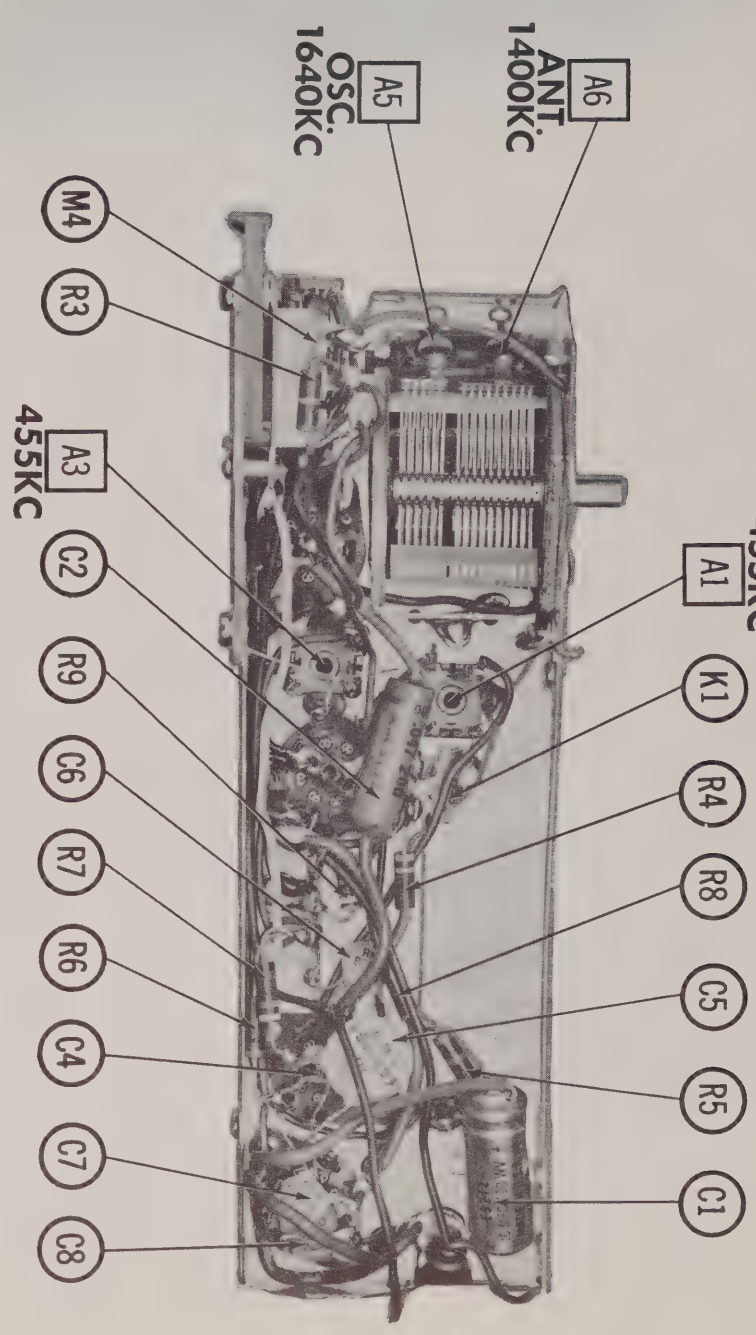
BATTERIES

ITEM No.	VOLTAGE	AIRLINE PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	1.5V	#27	964			21R			
M2	67½V	#40		477			P45		

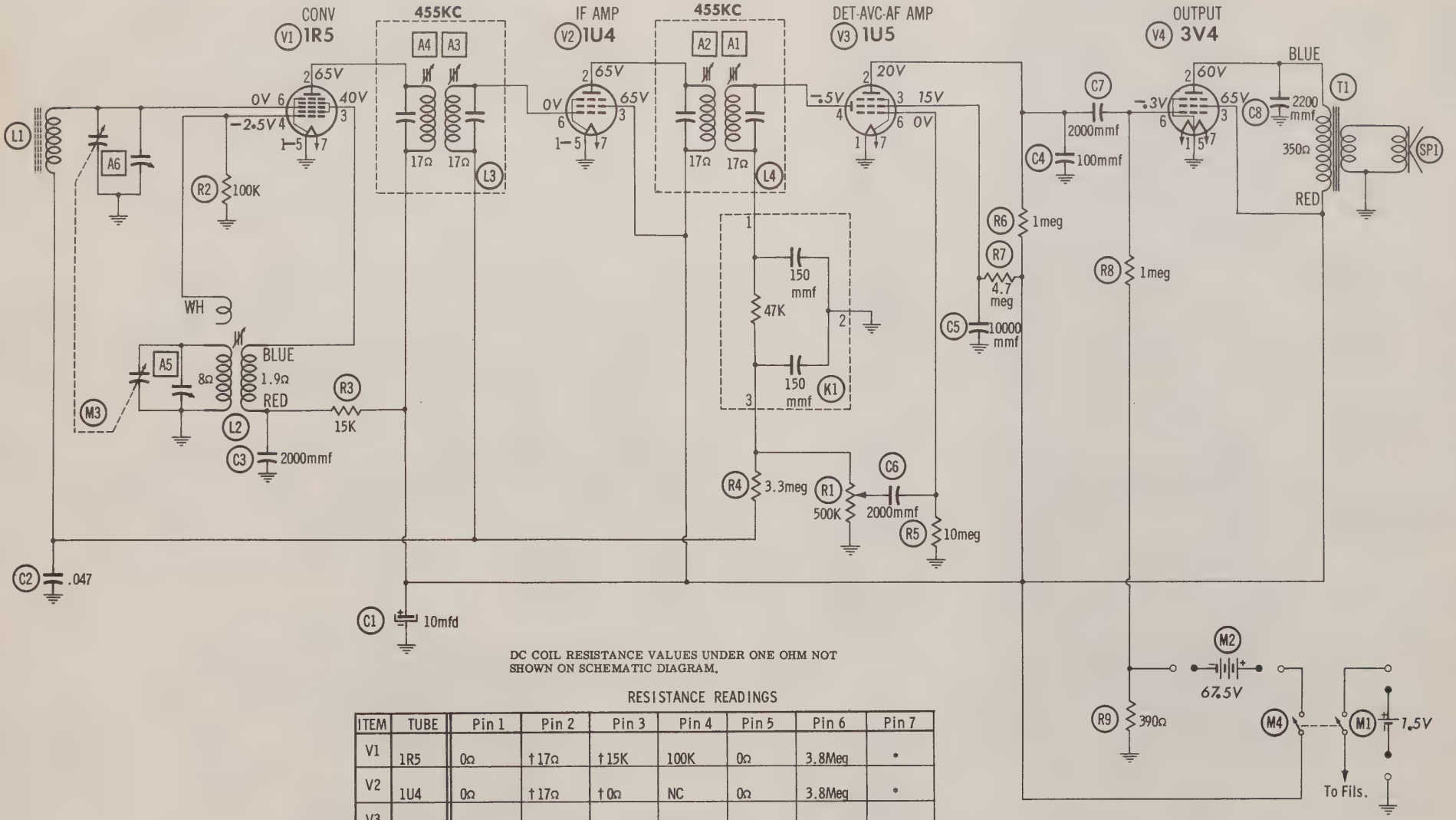
MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Tuning Cap.	E3517	Two Gang (15-245MMF, 17-115MMF)
M4	Switch	ENG	On-Off, Slide Type (DPDT)
	Trigger	E5038	Red, On-Off
	Cabinet	E7027	
	Knob	E5036W	Volume
	Knob	E5040	Tuning

CHASSIS—BOTTOM VIEW



AIRLINE MODEL GEN-1090A



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	0Ω	†17Ω	†15K	100K	0Ω	3.8Meg	*
V2	1U4	0Ω	†17Ω	†0Ω	NC	0Ω	3.8Meg	*
V3	1U5	0Ω	†1Meg	†4.7Meg	550K	TP	10Meg	*
V4	3V4	*	†350Ω	†0Ω	NC	0Ω	1Meg	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM POSITIVE TERMINAL OF C1.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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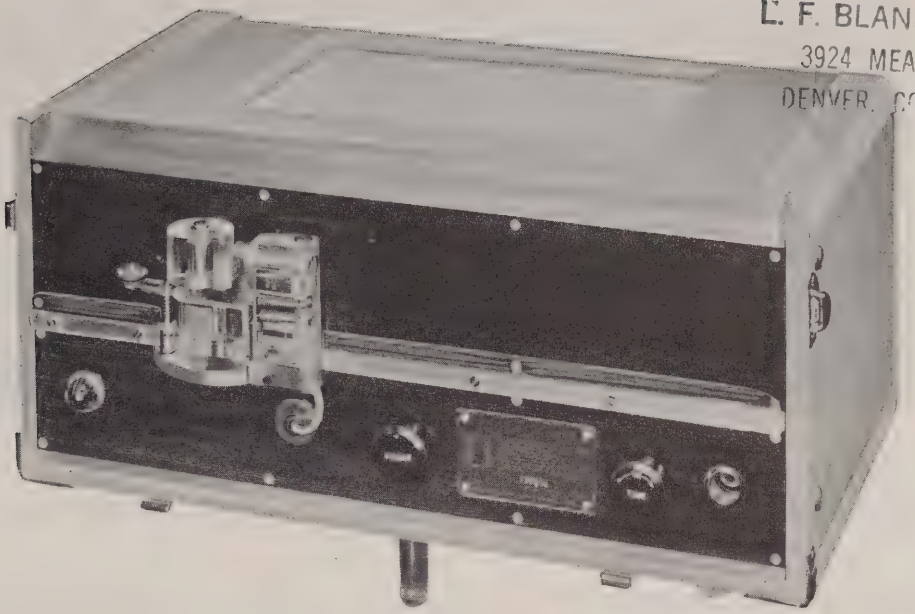
ELLAMAC
MODEL "Language Master"



ELLAMAC
MODEL "Language Master"

OPERATING INSTRUCTIONS

1. Place the machine on a table with the handle on top and the loudspeaker side away from you.

2. Loosen the latches, unlocking the one if necessary with the key provided. Remove the lid by disengaging the hinges with a slight movement to the right.

3. Remove the plastic support from the clip inside the lid, and insert it into the receptacle on the near side of the case. Rotate the support until the slot on it meets the pin inside the receptacle. At this point the support will seat against the receptacle collar. Slight additional rotation will prevent the support from dropping out.

4. Tilt the machine toward you until it is resting on the plastic support and the two rear rubber feet.

5. Remove the A. C. cord from the lid and insert it into the receptacle on the rear of the cabinet, and plug the other end into a 115 volt, 60 cycle Alternating Current outlet.

6. Turning the "Tone" control knob located at the lower right portion of the front panel starts both the card transport mechanism and the amplifier, and the unit is ready for use after an approximate 30 second warm-up period.

7. Place a Language Master card behind the card guide plate (37) and push it to the left until engagement is made with idler roller (11) and drive roller (62). Here the mechanism will take the card and pass it through at the proper rate. Be sure the card rests on the bottom of the guide. A slight downward pressure on the card until the transport mechanism takes hold may be necessary to realize this condition.

8. Regulate the loudness with the "Volume" control knob and the tone with the "Tone" control. For maximum high frequency response, turn the "Tone" control counter-clockwise to a point just before the switch-off position.

To Use Earphones Or Ext. Speaker-

1. Headphones or an external speaker may be plugged into the jack located to the right of the "Tone" control knob. Inserting a plug automatically disconnects the internal speaker. The output impedance at this jack is 3.2 ohms, and any speaker having an impedance of from 3.2 to 8 ohms or earphones from 128 ohms upward may be used.

THE McGRAW-HILL BOOK CO. NEW YORK, N. Y.

MADE BY ELLAMAC, INC.

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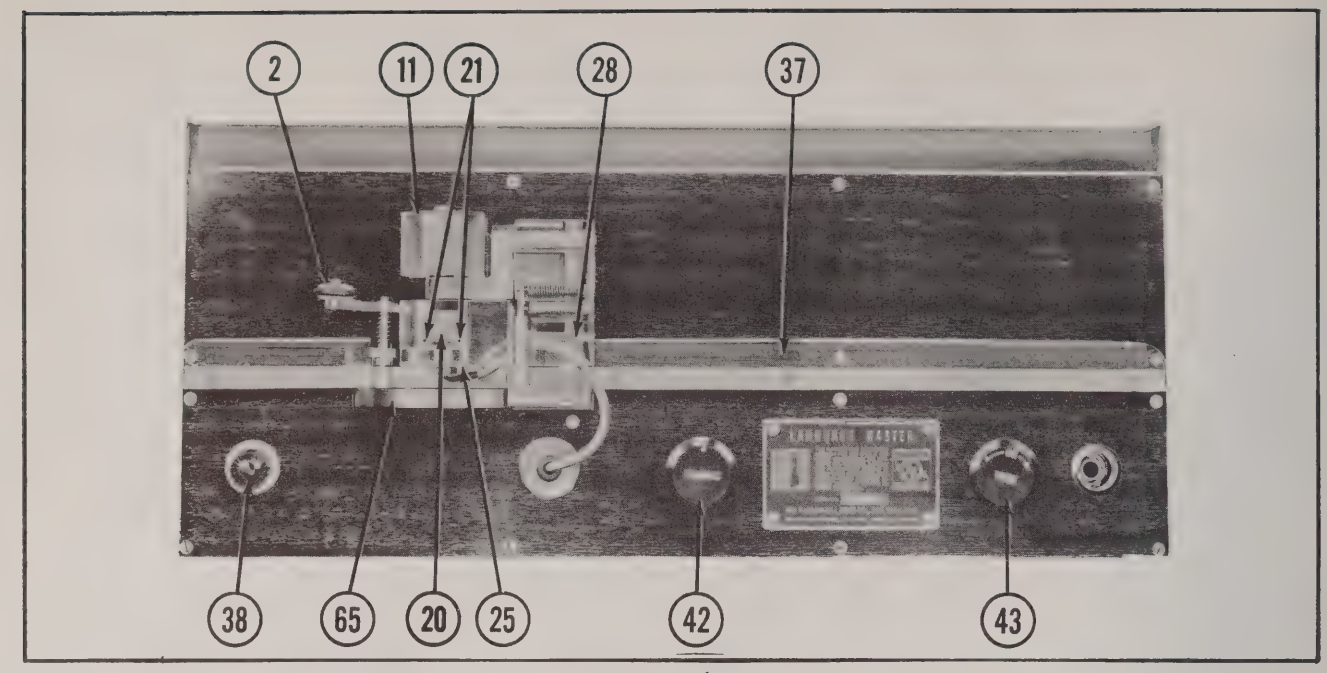

Figure 1

REMOVAL OF CHASSIS FROM CASE

1. To remove chassis from case, take out the 2 slotted head screws at each side and on the bottom of the instrument and push against the back of the chassis through the power connection opening.

PRELIMINARY TESTS

Test Procedure: Failure To Pass Any Of These Tests Indicates A Fault That Should Be Remedied.

1. Visually check unit for the following:

A. Check all springs to see that they are properly attached.

B. Check intermediate drive wheel (74), intermediate drive shaft (79), and small drive wheel (80) for free rotation. Check hinge casting (71) and bearing hinge (77) to see that they pivot freely on main hinge spindle (70) and hinge pin (78). (Pull assembly away from motor pulley (82) and drive wheel (65) to perform these operations).

C. Check drive roller (62), drive wheel (65), and drive shaft (57) for free rotation in same manner as described in step "B".

D. Check for free operation on main spindle (32) of head holder (22) and front pivot block and bracket assembly (16).

E. Check to see that all machine screws are in place and tight.

F. Check that all rubber drive wheel surfaces are free from dirt, oil, or grease.

G. Check that motor fan (101) clears motor and pilot light leads.

2. Turn unit on and let amplifier warm up; listen for objectional noises while checking the following:

A. With "Volume" control full on, tap unit and check for any loose connections.

B. Check that driving mechanism runs smoothly without jerking.

C. Clean playback head (20) with a clean soft cloth or with a cotton swab. If oxide coating on head surface is caked and hard to remove, dampen cloth or cotton with alcohol.

Place a Language Master card on the unit and check to see if any noticable distortion or "Wow" exists.

ADJUSTMENTS

Head Stop Screw (28) Adjustment-

Stop screw (28) determines the gap between playback head (20) and rubber drive roller (62). Adjust as follows:

1. Adjustment should be made so that there is a very slight gap between head (20) and rubber drive roller (62).

NOTE: If the gap is too great, the playback head will not contact the Language Master card properly and if the head bears against rubber drive roller (62) it will cause unnecessary wear and drag.

Playback Head Adjustment-

Adjustment of the playback head (20) should not be required unless the head becomes faulty and requires replacing. Replace and adjust head as follows:

1. Remove main spindle screw (10) and springs (19) and (26).

2. Remove pivot block (16) by sliding straight up and off main spindle (32).

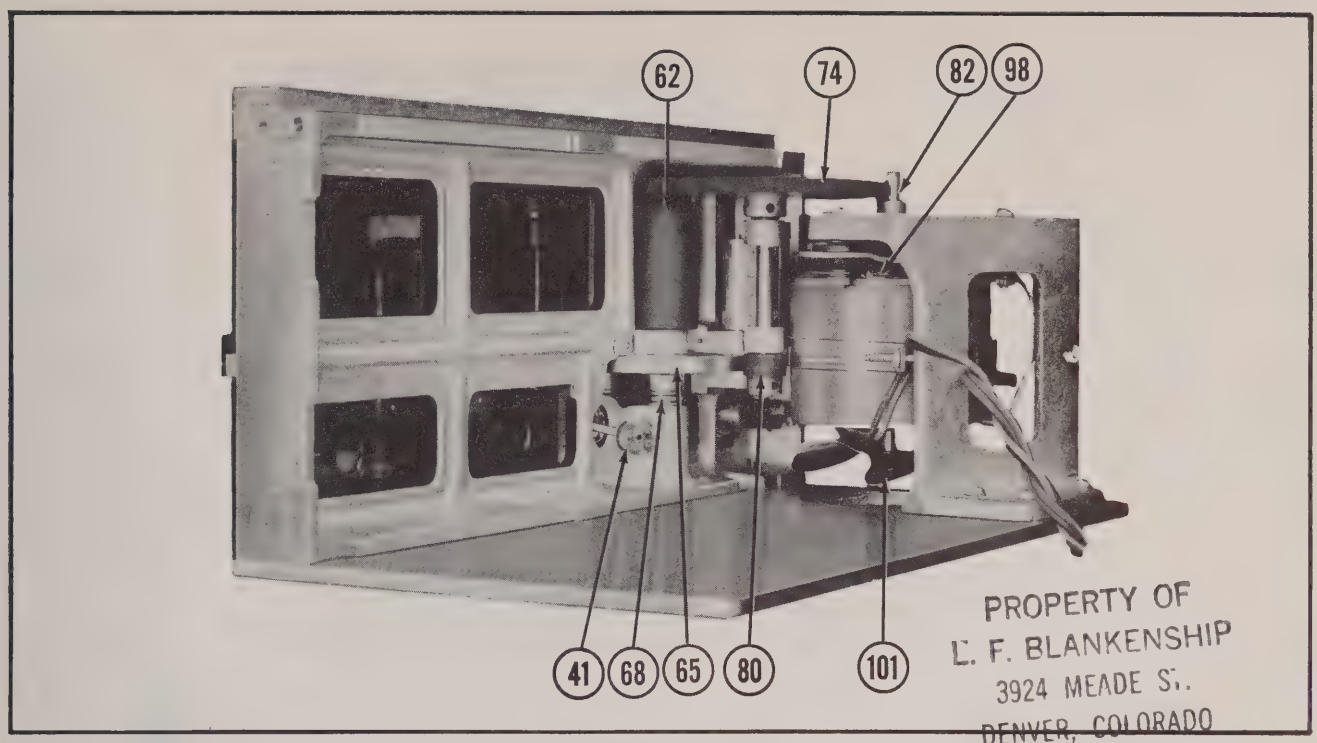

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Figure 2

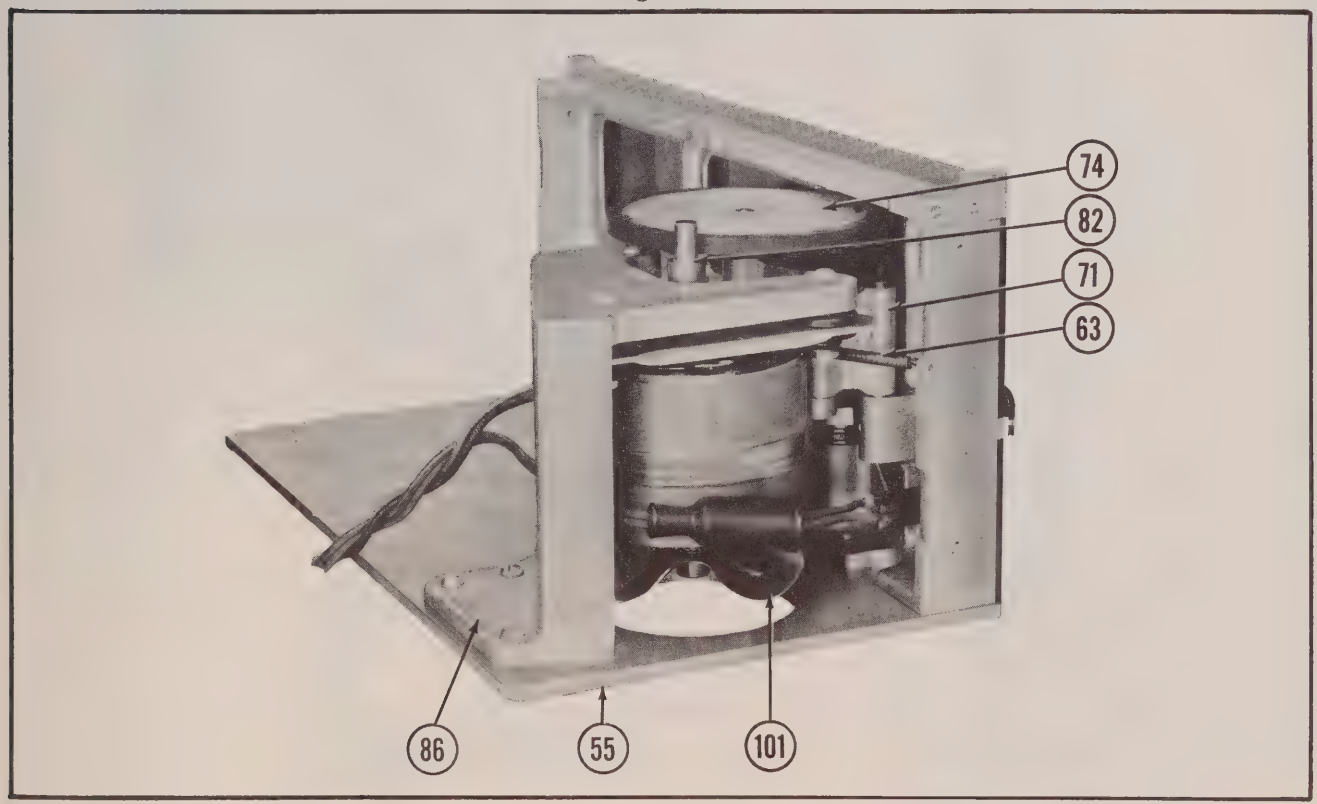


Figure 3

3. Unsnap panel cap and grommet assembly (40) from front panel (45). Remove head plug (41) from amplifier chassis.

4. Remove head holder (22) by sliding straight up and off main spindle (32).

5. Remove old head from head holder (22) being careful not to disturb the head height adjustment screws (25). If adjustment screws (25) are not moved, the new head will seat on them in the proper position.

6. Place new head in head holder (22) and tighten hex. nut (24) until just snug, not excessively tight .

7. Replace all parts on the unit in the reverse order in which they were taken off.

8. Using head alignment tape card, adjust head for maximum output by turning screws (21).

NOTE: Tape to use is attached to a Language Master card and recorded at 3,000 cycles.

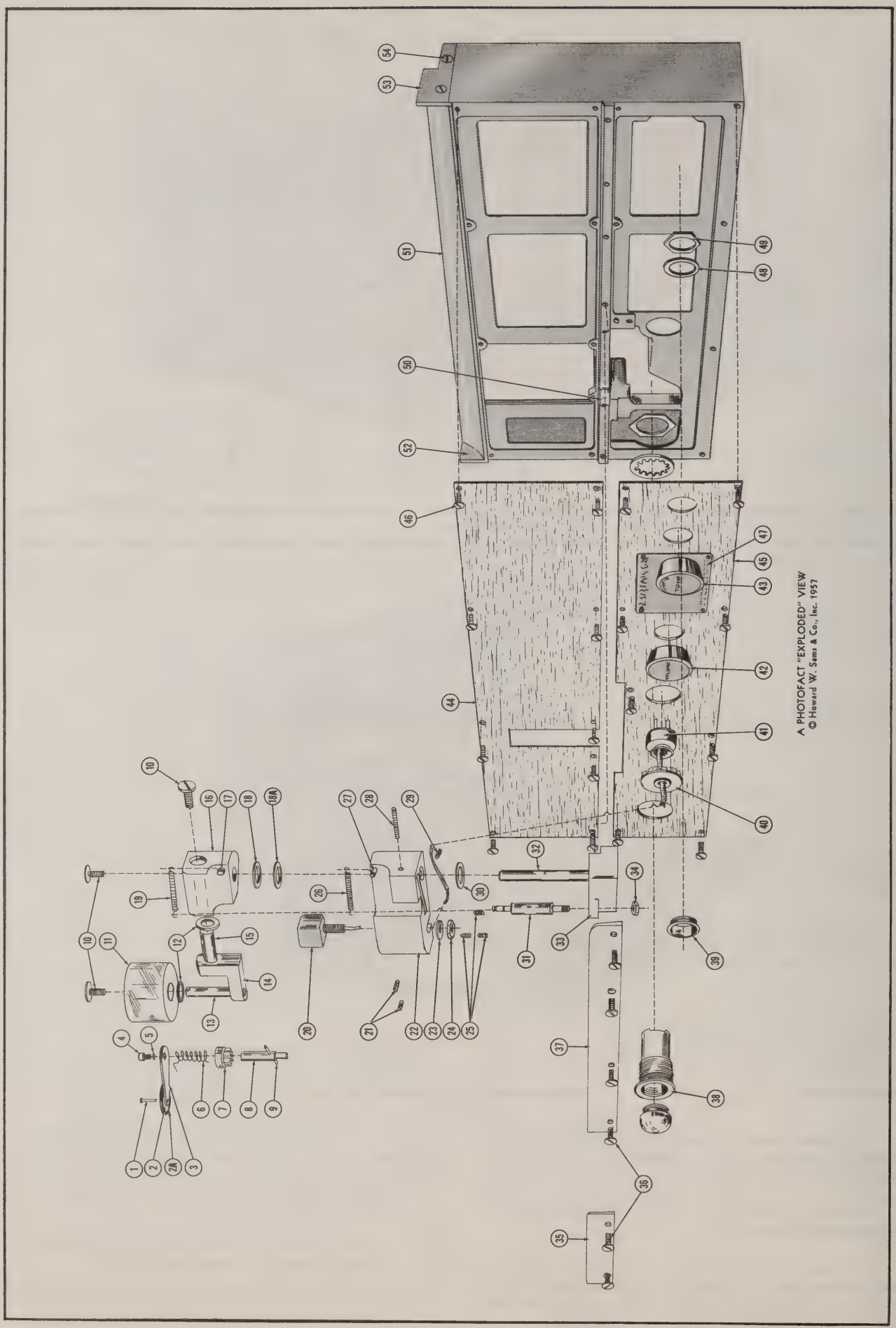


Figure 4A. Exploded View Of Parts In Front Of Baseplate.

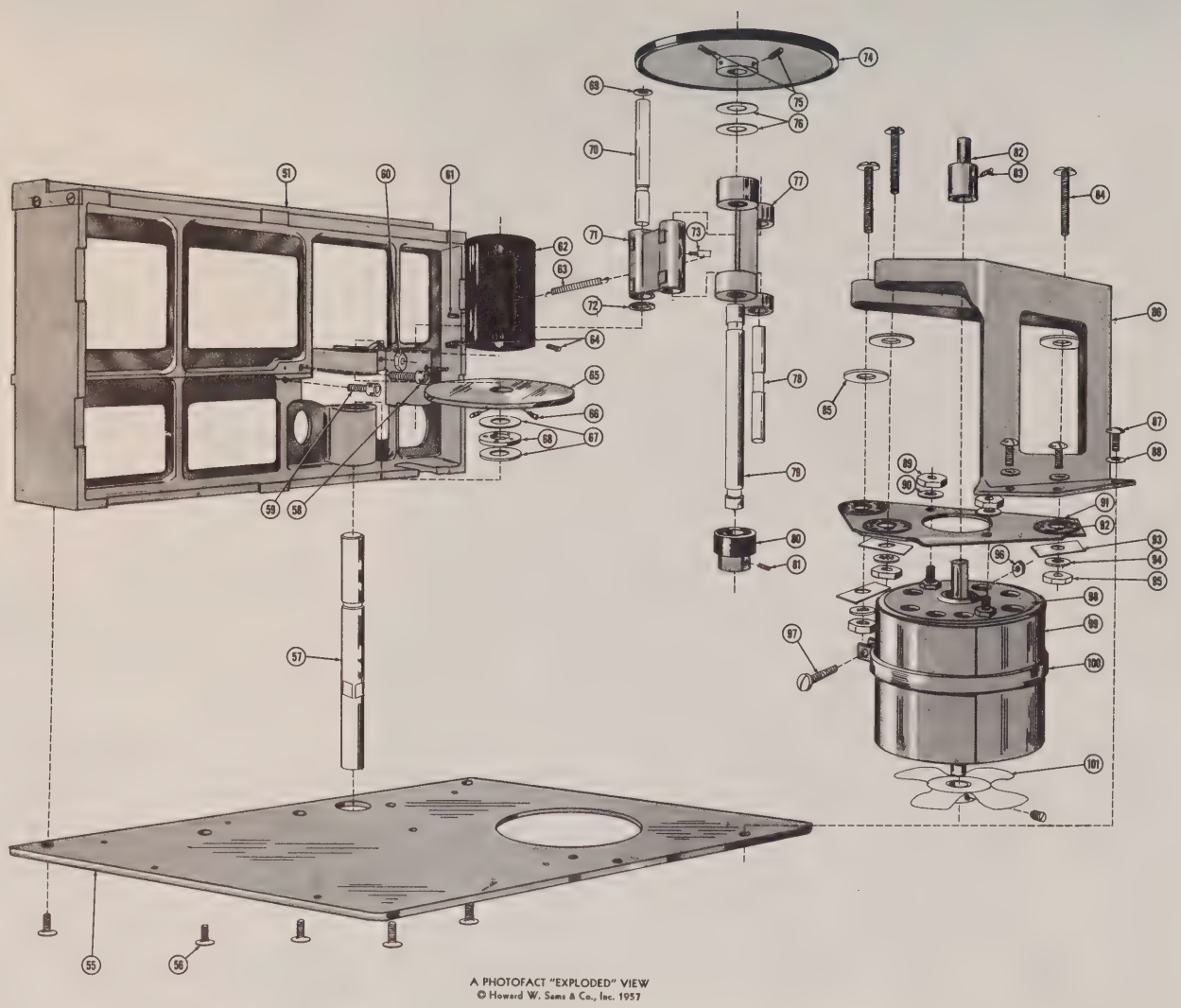
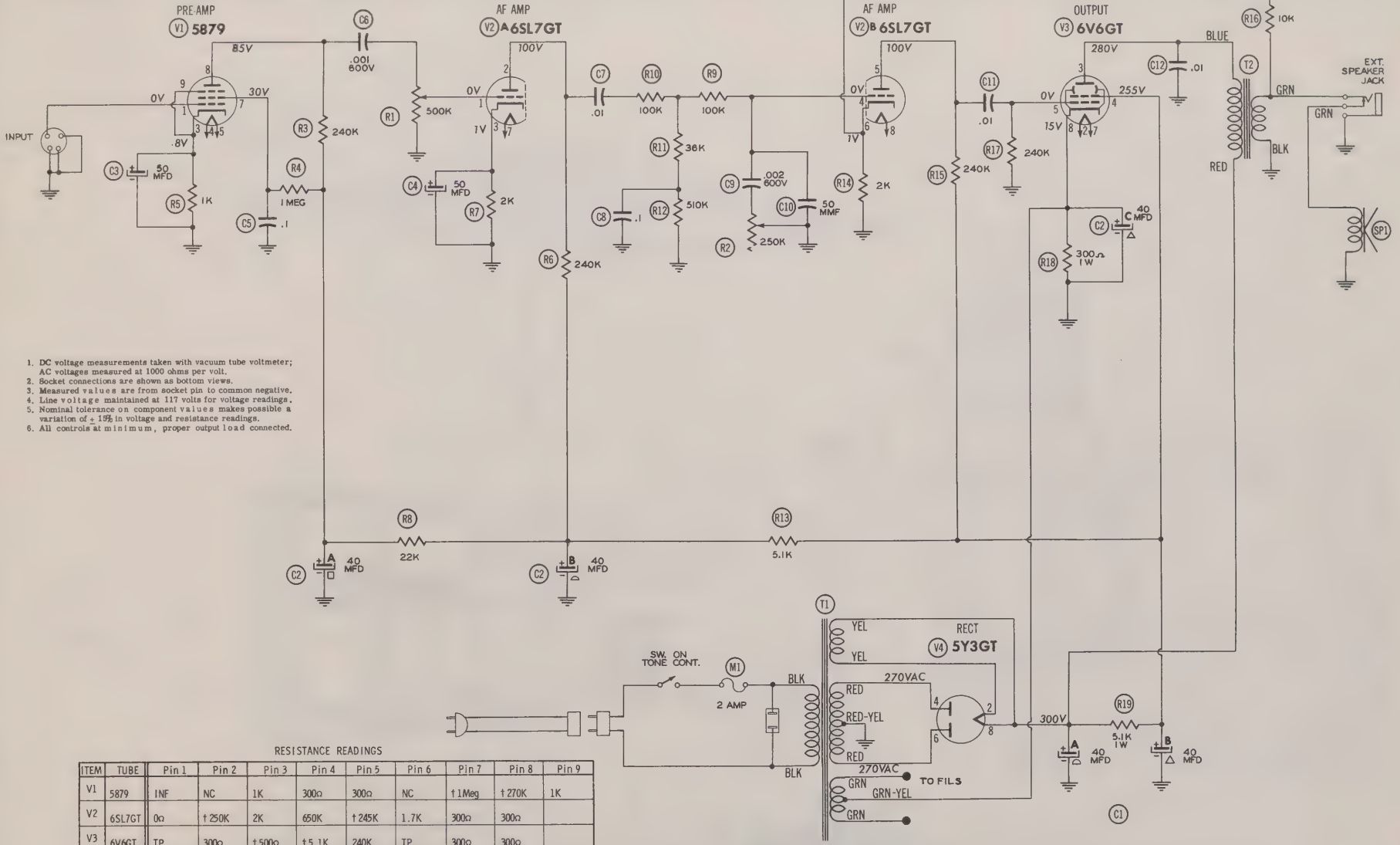


Figure 4B. Exploded View Of Parts At Rear Of Baseplate.



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5879	INF	NC	1K	300Ω	300Ω	NC	†1Meg	†270K	1K
V2	6SL7GT	0Ω	†250K	2K	650K	†245K	1.7K	300Ω	300Ω	
V3	6V6GT	TP	300Ω	†500Ω	†5.1K	240K	TP	300Ω	300Ω	
V4	5Y3GT	NC	50K	NC	350Ω	NC	350Ω	NC	50K	

† MEASURED FROM PIN 8 OF V4.
TP TIE POINT
NC NO CONNECTION

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350-3

LUBRICATION

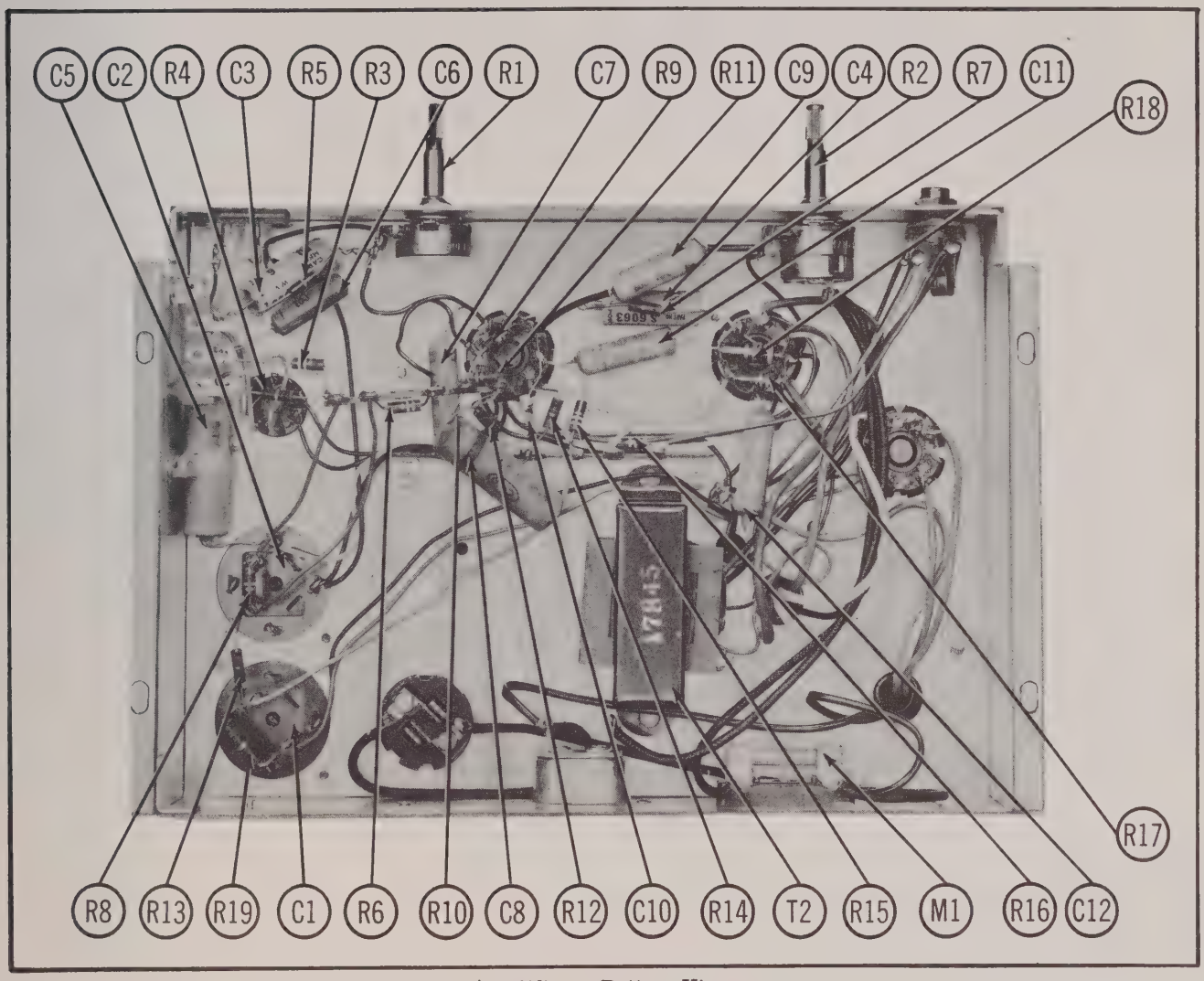
All rotating parts in this unit are provided with generous size oilite bearings which require no further attention. The hinge castings and their shafts may need a very small amount of light machine oil from time to time. Lubricate as follows:

1. Two drops of light machine oil on main hinge spindle (70).

2. One drop of oil applied to the top and bottom points of hinge casting (71) where they fasten into the bearing hinge (77).

3. One drop of light machine oil on thrust bearing (68).

NOTE: No oil should be applied on or near any of the plastic parts as this will only cause them to accumulate dust and dirt.



Amplifier - Bottom View

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	EM-158	Card Retainer Roll Pin	15	EM-141	Pivot Pin
2	EM-203	Card Friction Roller	16	EM-133	Pivot Block
2A	EM-204	Rubber Tire	17	EM-135	Spring Pin
3	EM-156	Card Retainer Arm	18	241-17722	Washer, Fiber . 020" Thick
4	EM-193	Fil. Hd. Screw, #2-56 x 1/4"	18A	241-12256	Washer, Fiber . 005" Thick
5	EM-157	Card Retainer Arm Washer	19	EM-176	Tension Spring
6	EM-155	Card Retainer Roll Spring	20	EM-200	Playback Head
7	EM-159	Spring Tension Adj. Nut	21	EM-212	Head Adj. Screw, #6-32 x 1/4
8	EM-154	Card Retainer Roll Shaft	22	EM-134	Head Holder
9	EM-227	Card Roll Shaft Pin	23	EM-209	Terminal Connection
10	EM-143	Binder Hd. Screw, #6-32 x 1/4	24		Head Mtg. Nut(Part of Item 20)
11	EMM-140-A	Idler Roll & Bearing Assy.	25	EM-213	Head Adj. Screw, #6-32 x 3/8
12	EM-175	Washer	26	EM-177	Tension Spring
13	EM-142-A	Spindle	27	EM-135	Spring Pin
14	EM-137	Front Roll Pivot Bracket	28	EM-211	Head Holder Stop Screw, #6-32 x 3/4

MECHANICAL PARTS LIST - Con't.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
29	EM-215	Retainer Screw, #6-32 x 1/2	65	EM-145	Drive Wheel
30	EM-175	Washer	66	EM-146	Socket Set Screw, #8-32 x 3/16
31	EM-132	Spring Post	67		Thrust Washer
32	EM-150	Main Spindle	68	EM-144	Thrust Bearing
33	EM-151	Main Spindle Support	69	EM-188	Tru-Arc Washer
34	EM-198	Hex. Nut, #6-32	70	EM-125	Main Hinge Spindle
35	EM-173	Card Guide Plate, L. H.	71	EM-126	Hinge Casting
36	EM-174	Card Guide Screws, #4-40 x 1/4	72	EM-175	Washer
37	EM-172	Card Guide Plate, R. H.	73	EM-136	Pivot Spring Post
38	EM-117	Pilot Light Assembly, Includes Nut and Lockwasher	74	EMM-123	Intermediate Drive Wheel Assy.
			75	EM-124	Socket Set Screw, #8-32 x 1/4
39	EM-181	Phone Jack Bushing	76	29602-133	Washer
40	EMM-182	Panel Cap & Grommet Assy.	77	EM-127	Bearing Hinge
41	EM-210 & EM-225	Head Plug & Shell	78	EM-129	Hinge Pin
			79	EM-131	Intermediate Drive Shaft
42	EM-194	Volume Control Knob	80	EMM-130	Small Drive Wheel & Tire Assy.
43	EM-195	Tone Control Knob	81	EM-146	Socket Set Screw, #8-32 x 3/16
44	EM-169	Upper Front Panel	82	EM-120	Motor Drive Wheel
45	EM-170	Lower Front Panel	83	EM-146	Socket Set Screw, #8-32 x 3/16
46	EM-171	Panel Mtg. Screws (17 Required) #2-56 x 1/4	84	EM-105	Round Hd. Mach. Screw, #10-32 x 1 1/4
47	EM-179	Name Plate	85	EM-233	Washer
48	EM-201	Phone Jack Bushing Washer	86	EM-102	Motor Bracket
49	EM-202	Phone Jack Bushing Lock Nut	87	EM-119	Round Hd. Mach. Screw, #10-32 x 1/2
50	EM-187	Card Retainer Shaft Support			
51	EMM-100	Frame Sub-Assembly	88	EM-229	Int. Lockwasher (For #10 Screw)
52	EM-217	End Trim Plate, L. H.	89	EM-106	Hex. Nut, #10-32
53	EM-216	End Trim Plate, R. H.	90	EM-229	Int. Lockwasher (For #10 Screw)
54	EM-174	End Plate Mtg. Screws, #4-40 x 1/4	91	EM-103	Motor Mtg. Plate
55	EM-101	Base Plate	92	EM-104	Motor Mtg. Grommet
56	EM-189	Flat Hd. Mach. Screw, #10-24 x 1/2	93	EM-234	Motor Mtg. Washer
57	EM-149	Drive Shaft	94	EM-229	Int. Lockwasher(For #10 Screw)
58	EM-153	Socket Hd. Cap. Screw, #6-32 x 1	95	EM-106	Hex. Nut, #10-32
59	EM-152	Socket Hd. Cap. Screw, #6-32 x 1/2	96	EM-222	Hex. Nut, #8-32
60	EM-198	Hex. Nut, #6-32	97	EM-221	Round Hd. Mach. Screw, #8-32 x 1
61	EM-136	Pivot Spring Post	98	EM-111	Motor
62	EMM-147	Drive Roll Assembly	99	EM-109	Motor Shield
63	EM-186	Spring (Frame to Hinge)	100	EM-220	Motor Shield Clamp
64	EM-213	Drive Roll Mtg. Screw, #6-32 x 3/8	101	EM-121	Motor Fan (Includes Set Screw)

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1	5879	5879, Pre-Amp.	C12	S3521	Cap., Molded Paper, .01MFD.
V2	6SL7GT	6SL7GT, AF Amp.	R1	241-17940	Volume Control, 500KΩ
V3	6V6GT	6V6GT, Audio Output	R2	211-17847	Tone Cont., On-Off Sw., 250KΩ
V4	5Y3GT	5Y3GT, Rectifier	R3	29501-48	Resistor, 240KΩ, 1/2 Watt
C1A	241-14236	Elect. Cap., 40MFD. @450V.	R4	29501-57	Resistor, 1Meg., 1/2 Watt
C1B		Elect. Cap., 40MFD. @450V.	R5	29501-11	Resistor, 1KΩ, 1/2 Watt
C2A	241-14238	Elect. Cap., 40MFD. @450V.	R6	29501-48	Resistor, 240KΩ, 1/2 Watt
C2B		Elect. Cap., 40MFD. @450V.	R7	29501-14	Resistor, 2KΩ, 1/2 Watt
C2C		Elect. Cap., 40MFD. @25V.	R8	29501-29	Resistor, 22KΩ, 1/2 Watt
C3	S6063	Elect. Cap., 50MFD. @6V.	R9	29501-41	Resistor, 100KΩ, 1/2 Watt
C4	S6063	Elect. Cap., 50MFD. @6V.	R10	29501-41	Resistor, 100KΩ, 1/2 Watt
C5	S3595	Cap., Molded Paper, .1MFD. @400V.	R11	29501-33	Resistor, 36KΩ, 1/2 Watt
			R12	29501-53	Resistor, 510KΩ, 1/2 Watt
C6	S4281	Cap., Molded Paper, .001MFD. @600V.	R13	29501-21	Resistor, 5.1KΩ, 1/2 Watt
			R14	29501-14	Resistor, 2KΩ, 1/2 Watt
C7	S3521	Cap., Molded Paper, .01MFD. @400V.	R15	29501-48	Resistor, 240KΩ, 1/2 Watt
			R16	29501-24	Resistor, 10K, 1/2 Watt
C8	S3595	Cap., Molded Paper, .1MFD. @400V.	R17	29501-48	Resistor, 240KΩ, 1/2 Watt
			R18	29501-98	Resistor, 300Ω, 1 Watt
C9	S4510	Cap., Molded Paper, .002MFD. @600V.	R19	29501-75	Resistor, 5.1KΩ, 1 Watt
			T1	242-17934	Power Transformer
C10	S6065-11	Cap., Ceramic, 50MMF. @500V.	T2	212-17845	Output Transformer
C11	S3521	Cap., Molded Paper, .01MFD. @400V.	SP1	211-17844	Speaker
			M1	P8755-7	Fuse (2 Amp.)

FIRESTONE
MODEL 4-A-152 (Code 364-6-360)

FIRESTONE
MODEL 4-A-152 (Code 364-6-360)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

FIRESTONE
MODEL 4-A-152 (Code 364-6-360)

TRADE NAME	Firestone Model 4-A-152 (Code 364-6-360)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	AC Operated Portable AM Receiver With 4 Speed Automatic Record Changer
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .27 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod)	600KC	Across voice coil.	A1, A2, A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1620KC	Tuning gang fully open.	"	A5	"
3.		"	1400KC	Tune to 1400KC signal.	"	A6	"

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M MODEL 1200 - PHOTOFACT SET 290 FOLDER 11 OR RECORD CHANGER MANUAL CM-7.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

FIRESTONE
MODEL 4-A-152

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det-AVC-AF Amp.	12AT6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	FIRESTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150			BBRQ44315C	WQ230			
B	40	150							
C	20	150							
D	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C3	5000			BPD-005	DD-502	K080	ED-005	DC525	5HK-D5	
C4	100			BPD-0001	DD-101	G042	ED-100	UC-531	5GA-T1	Note 1
C5	.05	200		BPD-05	DF-503	CUB2S5		GEM-215	2TM-S5	
C6	.05	200		BPD-05	DF-503	CUB2S5		GEM-215	2TM-S5	
C7	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C8	5000			BPD-005	DD-502	K080	ED-005	DC525	5HK-D5	
C9	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C10	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C11	2	50								

Note 1: Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	412A	AB-76	A47-2Meg-Z	Q13-139	U55	Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2A	500K	½	411					Tone (Note 1)
B	Switch							

Note 1: Alternate part #409.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

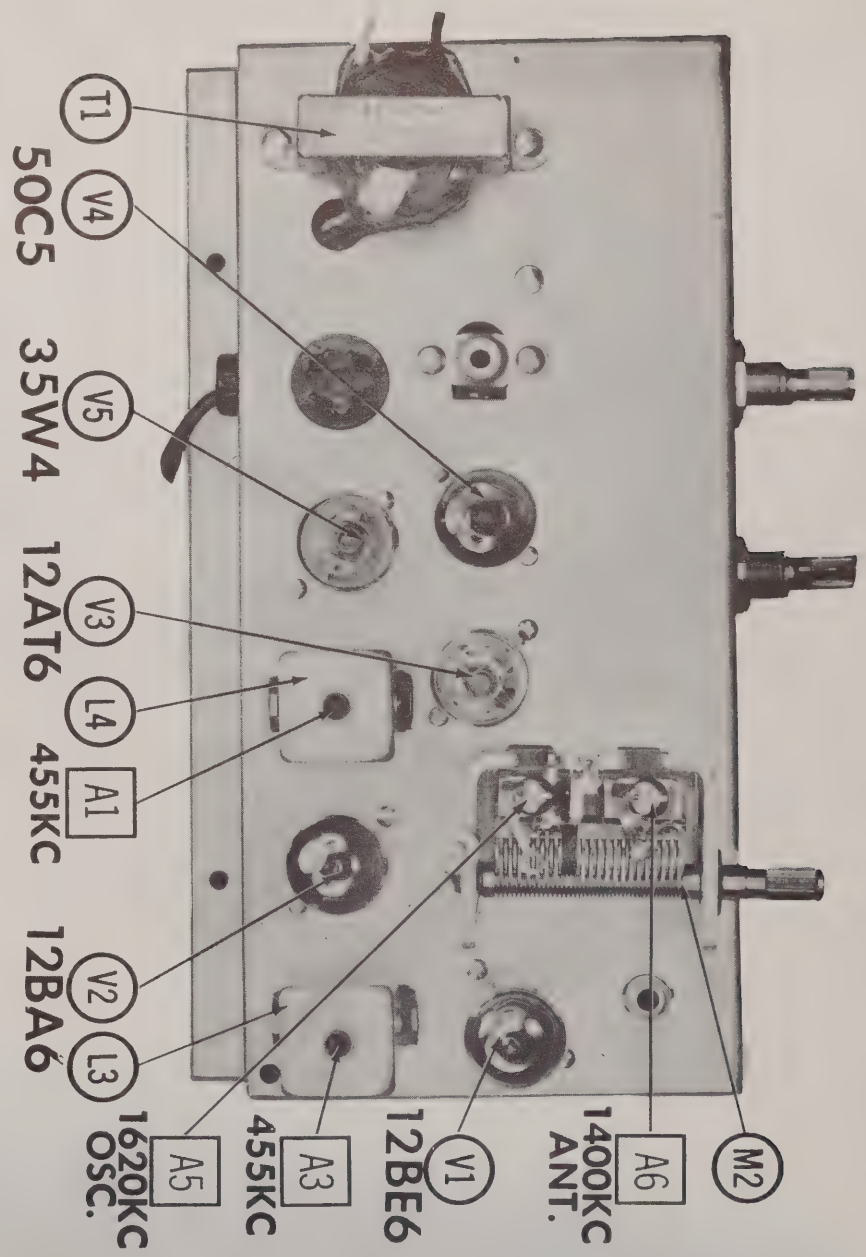
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R3	22K			BTS-22K	
R4	150Ω			BTS-150	
R5	2.2Meg			BTS-2.2Meg	
R6	470K			BTS-470K	
R7	47K			BTS-47K	
R8	270K			BTS-270K	
R9	2200Ω			BTS-2200	
R10	22K			BTS-22K	Note 1
R11	150Ω			BTS-150	
R12	1000Ω	1		BTA-1000	
R13	470Ω	1		BTA-470	Note 2
R14	27Ω	4		PW4-25	

Note 1: 10K is used in some versions.
Note 2: 270Ω 1 W is used in some versions.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	3-4Ω	1209C			A-3332			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	FIRESTONE PART No.	QUAM PART No.	
SP1 SP2	6" 3½" 3½"	PM PM PM	3-4Ω 11. 2Ω	2627 2630 2621 ①	6A1 3A15T	① Alternate speaker.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	1509				
L2	Osc. Coil	1408				
L3	Input IF	1405	16-6758	BC-352	12-C1	
L4	Output IF	1406A	16-6758	BC-353	12-C2	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	FIRESTONE PART No.	REPLACEMENT DATA	
K1	Detector-Audio Net.	6. 8Meg, 470K, 470K, 220MMF, 250MMF, 5000MMF, 5000MMF	827	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-113-2 PC-151 116TM2 1408-02 DT-2

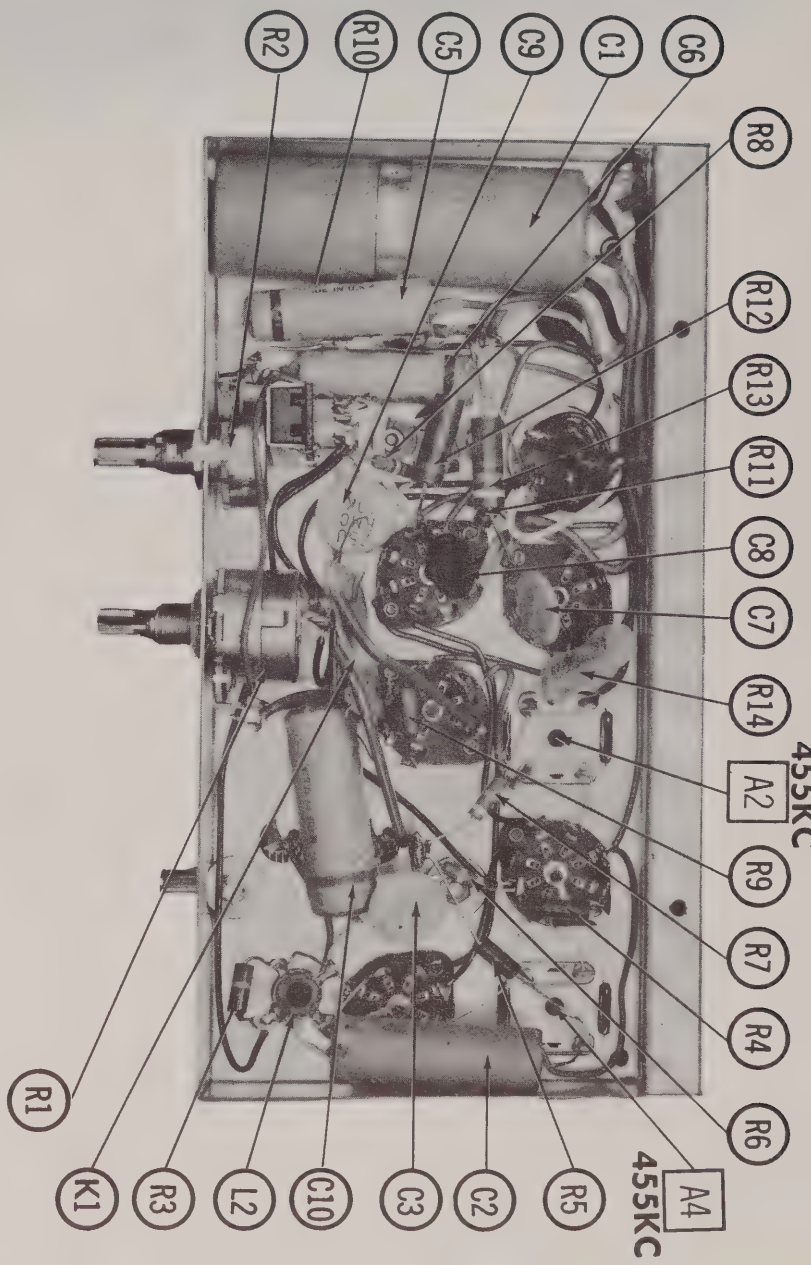
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	FIRESTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	2575A			56	*PT-1	* Not required unless original mounting bracket is damaged.

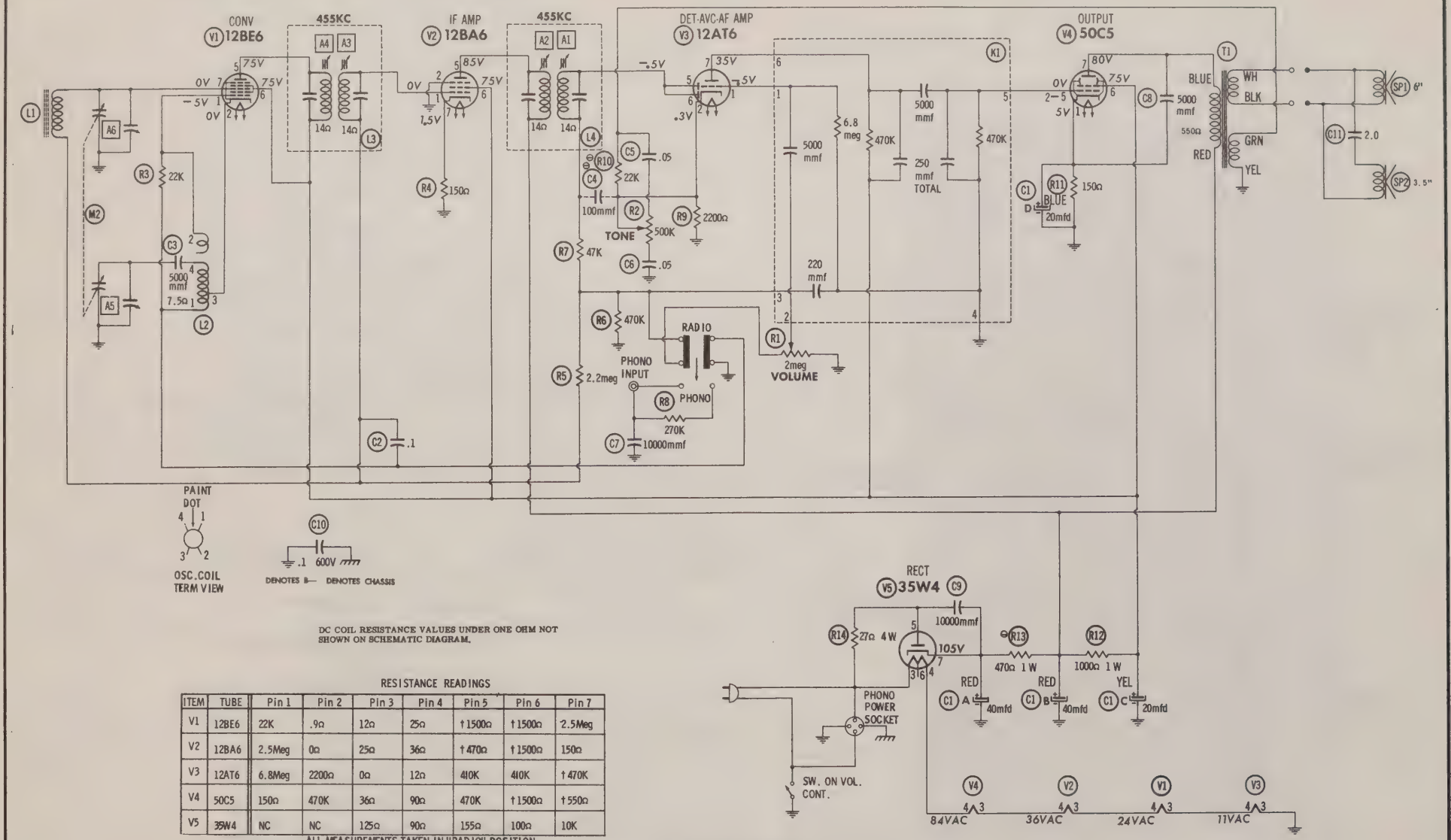
MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M2	Tuning Cap.	1017	2 Gang (33-400MMF, 11-100MMF)
	Case	2063C	Portable
	Handle	1772	Includes Loops.
	Knob	2430B	On-Off-Volume.
	Knob	2430	Tuning
	Knob	2430A	Tone

CHASSIS—BOTTOM VIEW



FIRESTONE MODEL 4-A-152



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.9Ω	12Ω	25Ω	†1500Ω	†1500Ω	2.5Meg
V2	12BA6	2.5Meg	0Ω	25Ω	36Ω	†470Ω	†1500Ω	150Ω
V3	12AT6	6.8Meg	2200Ω	0Ω	12Ω	410K	410K	†470K
V4	50C5	150Ω	470K	36Ω	90Ω	470K	†1500Ω	†550Ω
V5	35W4	NC	NC	125Ω	90Ω	155Ω	100Ω	10K

ALL MEASUREMENTS TAKEN IN "RADIO" POSITION

† MEASURED FROM PIN 7 OF V5.

NC NO CONNECTION.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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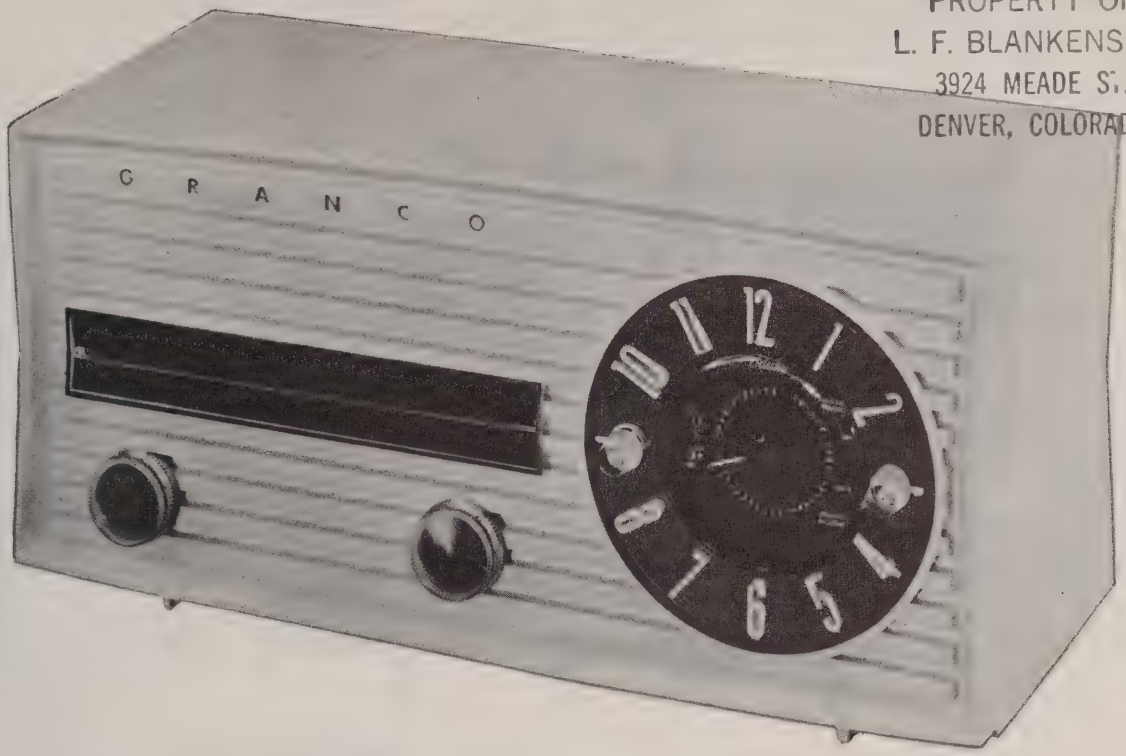
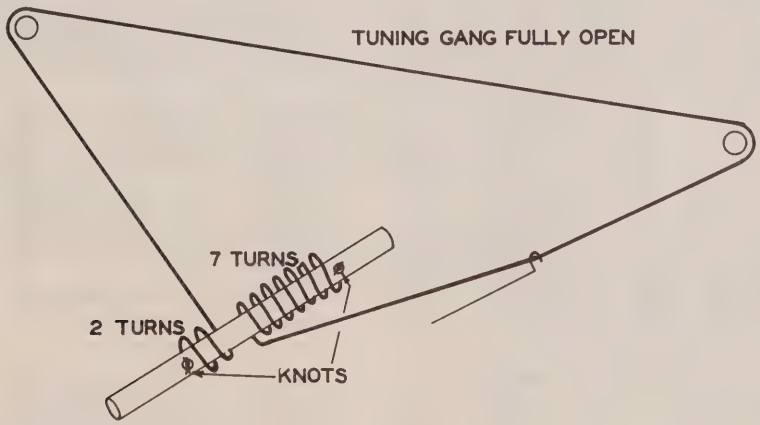


GRANCO
MODEL 770

TRADE NAME	Granco Model 770	
MANUFACTURER	Granco Products, Inc., 36-07 20th. Ave., Long Island City 5, N. Y.	
TYPE SET	AC Operated FM-AM Receiver With Electric Clock	
TUBES (Seven)	Types 12BA6 FM RF Amplifier, 12AT7 FM Mixer-Osc., 12BE6 AM Converter, 12BA6 1st. IF Amplifier, 12BA6 2nd. FM IF Amp.-AM Det., 19T8 Ratio Det.-AF Amp., 35C5 Output	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING .35 Amp. @ 117 Volts AC
TUNING RANGE -BROADCAST	535KC-1650KC	FREQ. MOD. 885MC-108MC



DIAL CORD STRINGING

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	12BA6	
V2	FM Mixer-Osc.	12AT7	
V3	AM Converter	12BE6	
V4	1st. IF Amplifier	12BA6	
V5	2nd. FM IF Amp. -AM Det.	12BA6	
V6	Ratio Det. -AF Amp.	19T8	
V7	Output	35C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA GRANCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲80	150		AFH3-11-40	XB0181	FP216	TMD-17	D-085	TVL-2442.1
B	●50	150							
C2	2	50		PRS50V2	BBR2-50	TC302	TD-2-50	MT-0502	TVA-1301

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

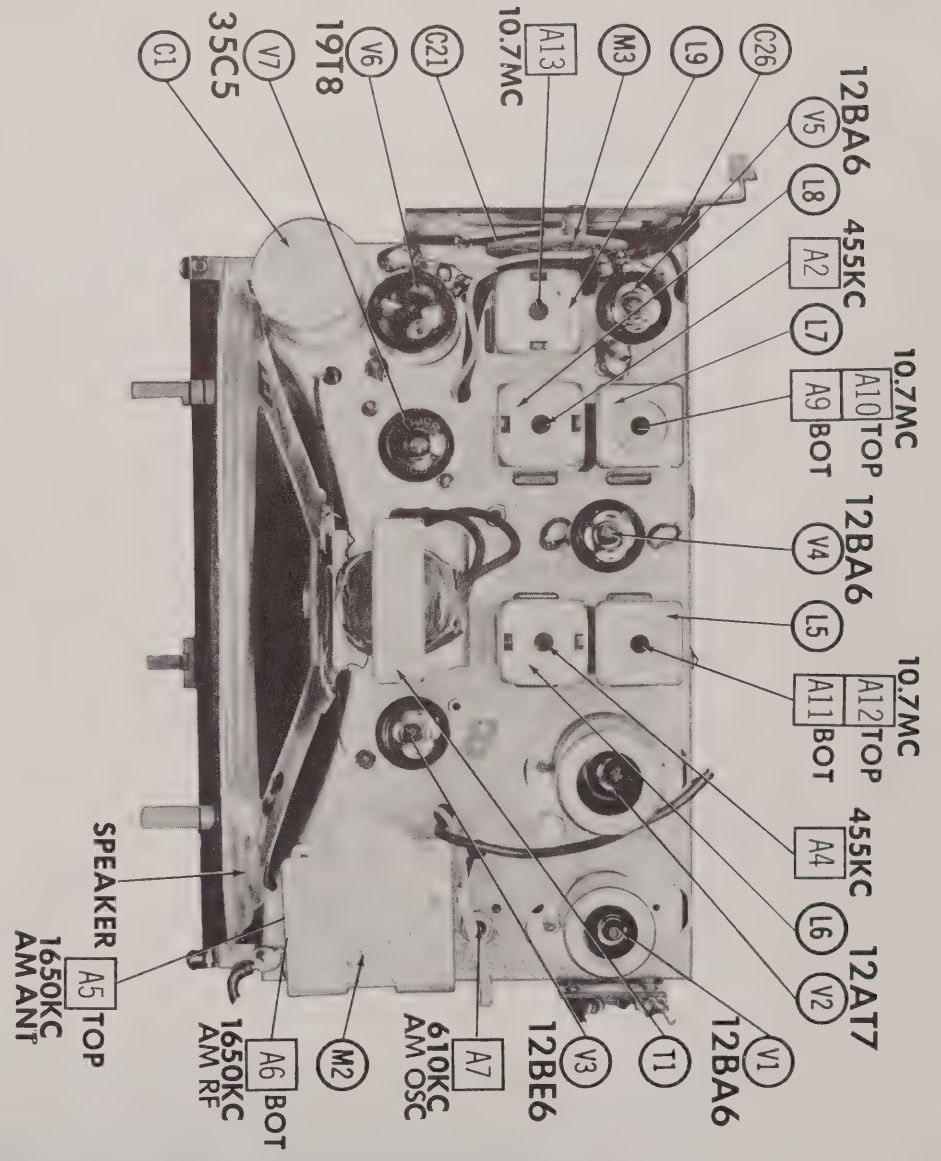
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA GRANCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	50			BPD-00005	DD-500	L10Q5	ED-50	UC-545	5GA-Q5	
C4	10			BPD-00001	DD-100	L10Q1	ED-10	UC-541	5GA-Q1	
C5	50									
C6	1500			BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	
C7	.2									
C8	50			BPD-00005	DD-500	L10Q5	ED-50	UC-545	5GA-Q5	
C9	1500			BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	
C10	8.5									
C11	80									
C12	2000									
C13	5									
C14	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C15	4700			BPD-0047	D6-472	BYA10D47	GP-4700	UC-5247	5HK-D47	
C16	1500			BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	
C17	220			BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C18	6.8									
C19	1500			BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	
C20	100									
C21	1500			BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	
C22	4700			BPD-0047	D6-472	BYA10D47	GP-4700	UC-5247	5HK-D47	
C23	220			BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C24	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C25	4700			BPD-0047	D6-472	BYA10D47	GP-4700	UC-5247	5HK-D47	
C26	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C27	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C28	1500			BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	
C29	1500			BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	Note 1
C30	1500			BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	
C31	1500			BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	
C32	1500			BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA GRANCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½		AB-69	A47-1Meg-S	Q11-137		Volume
B	Shaft			AK-19	RN-3	TQ		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GRANCO PART No.	IRC PART No.	
R2	470K			BTS-470K	
R3	330Ω			BTS-330	
R4	2200Ω			BTS-2200	
R5	10K			BTS-10K	
R6	22K			BTS-22K	
R7	330Ω			BTS-330	
R8	330Ω			BTS-330	
R9	2.7Meg			BTS-2.7Meg	
R10	1Meg			BTS-1Meg	
R11	330Ω			BTS-330Ω	
R12	47K			BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GRANCO PART No.	IRC PART No.	
R13	1Meg			BTS-1Meg	
R14	22K			BTS-22K	
R15	4.7Meg			BTS-4.7Meg	
R16	220K			BTS-220K	
R17	470K			BTS-470K	
R18	160Ω			BTS-160	
R19	10Ω			BTS-10	
R20	10Ω			BTS-10	
R21	10Ω			BTS-10	
R22	470Ω	1		BTA-470	
R23	900Ω	7		1 3/4A-900	
R24	22Ω	1		BTA-22	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	GRANCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	33-3		A-3025		26S58	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	GRANCO PART No.	QUAM PART No.	
SP1	4" x 6"	PM	3-4Ω	34-4	46A1 ①	① Fabricate mounting.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		GRANCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	RF Choke		19-1003	BC-537	4608	3.1 Microhenries
L2	RF Choke		19-1003	BC-537	4608	3.1 Microhenries
L3	Ant. Loop Stick					368 Microhenries
L4	AM Osc. Coil					
L5	1st. FM IF	57462				
L6	1st. AM IF	BL576	16-6758	BC-352	12-C2	
L7	2nd. FM IF	57462				
L8	2nd. AM IF	BL576	16-6758	BC-352	12-C2	
L9	Ratio Det.	CL473	17-3498	FM-255	1465	
L10	FM Mixer Coil					
L11	FM Osc. Coil					
L12	Cathode Choke					

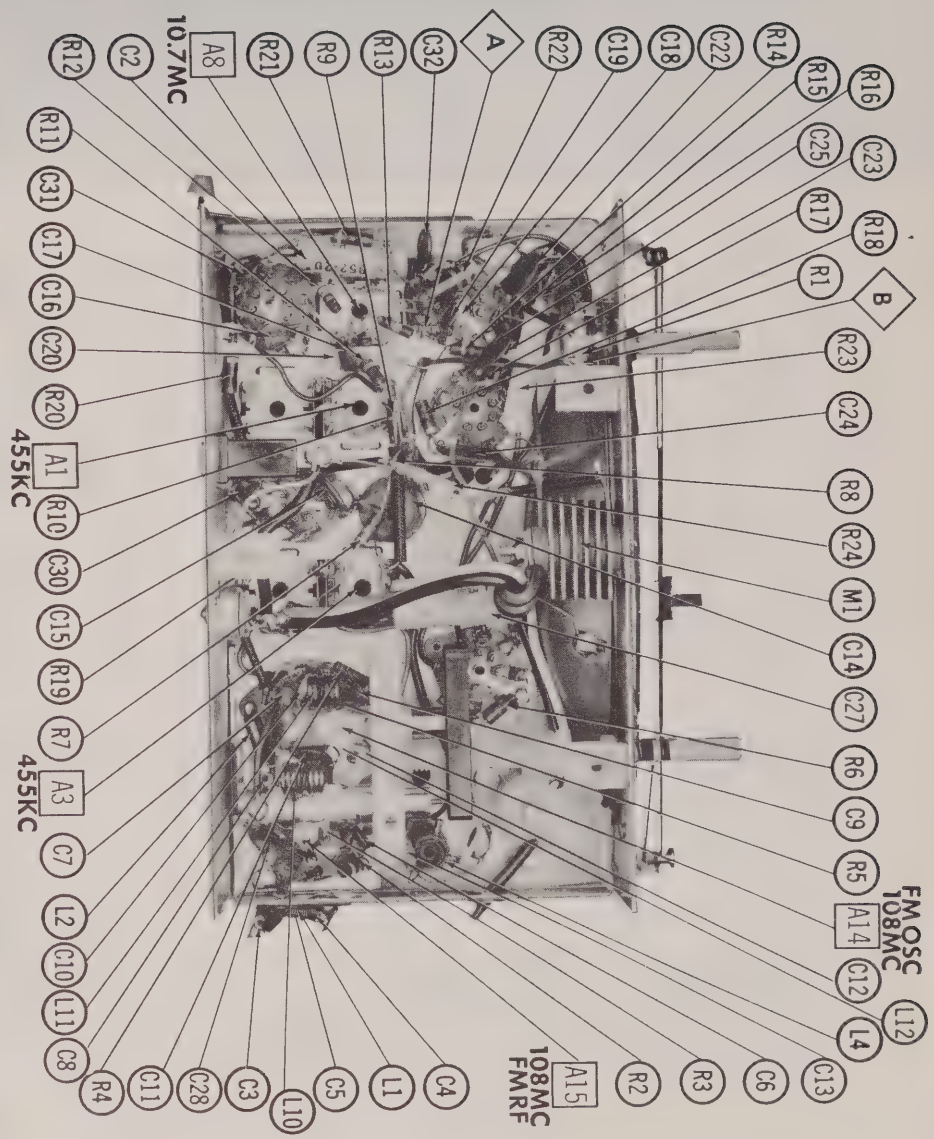
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	GRANCO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.080A	H100A	1004A	RS100A	6S100	5M1	100A	

MISCELLANEOUS

ITEM No.	PART NAME	GRANCO PART No.	NOTES
M2	Tuning Cap.	618268	2 Gang (15-236, 14-116MMF)
M3	Switch		Wafer type
M4	Clock		

CHASSIS—BOTTOM VIEW



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V3). Low side to chassis.	455KC (400∿Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1650KC	"	"	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	610KC	"	Tune to 610KC signal	"	A7	Adjust for maximum output while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point (A) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (B). Common to point (C).	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (A). Low side to chassis.	A8, A9, A10, A11, A12	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A13	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Two 150Ω Carbon Resistors	High side to antenna input thru 150Ω. Low side to chassis thru 150Ω.	108MC	FM	108MC (Slugs out)	DC probe to point (A). Common to chassis.	A14, A15	Adjust for maximum deflection.
7.	"	"	88MC	"	88MC (Slugs in)	"	L10, L11	Compress or expand coil turns for maximum deflection.

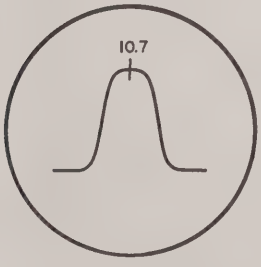


FIG. 1

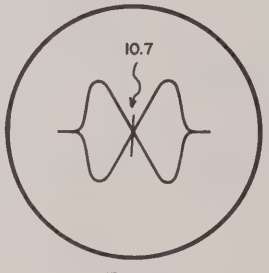
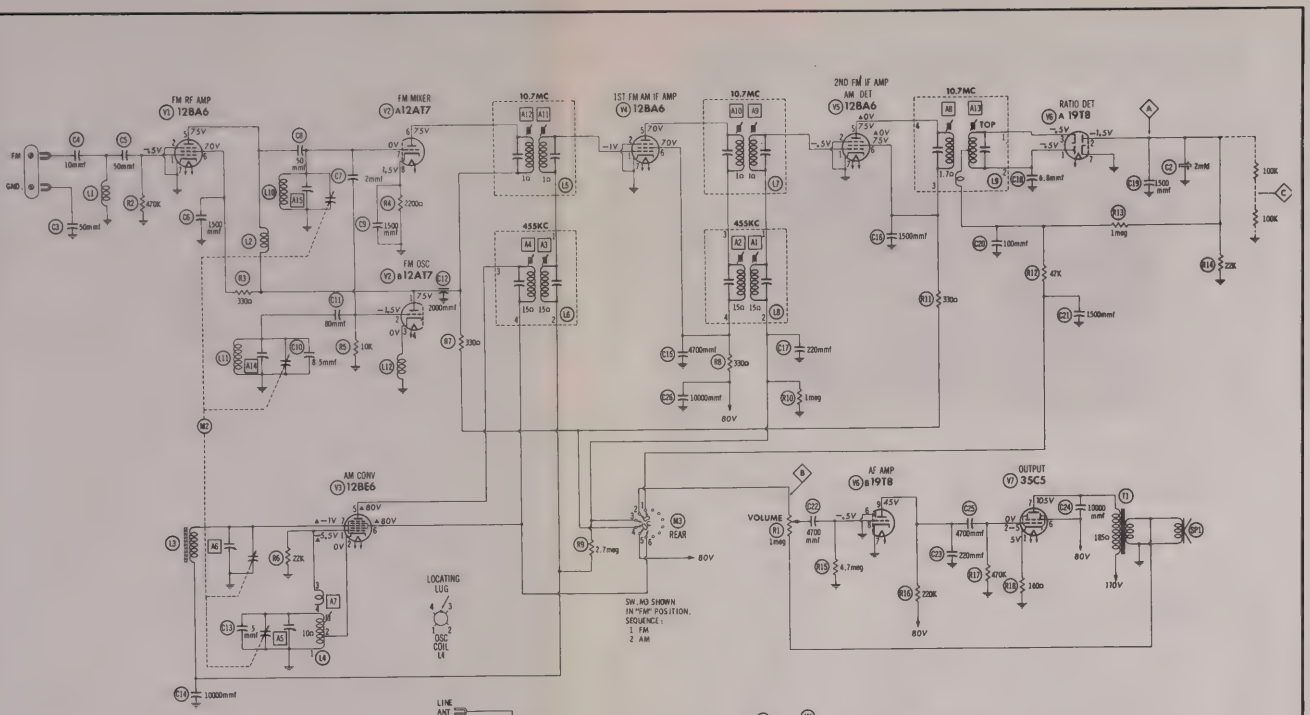


FIG. 2



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	470K	0Ω	0Ω	12Ω	↑1200Ω	↑1600Ω	0Ω		
V2	12AT7	↑1200Ω	10K	.4Ω	12Ω	25Ω	↑1200Ω	0Ω	2200Ω	18Ω
V3	12BE6	22K	.6Ω	110Ω	100Ω	▲↑900Ω	▲↑900Ω	▲3.2Meg		
V4	12BA6	3.7Meg	0Ω	35Ω	45Ω	↑1200Ω	↑1200Ω	0Ω		
V5	12BA6	1meg ▲500Ω	0Ω	55Ω	67Ω	↑1200Ω	↑1200Ω	0Ω		
V6	19T8	500K	22K	500K	77Ω	100Ω	0Ω	0Ω	4.7Meg	↑220K
V7	35C5	160Ω	470K	145Ω	118Ω	470K	↑900Ω	↑185Ω		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
▲ MEASURED IN "AM" POSITION
↑ MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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HARMAN-KARDON MODEL T-10

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HARMAN-KARDON
MODEL T-10

HARMAN-KARDON
MODEL T-10

TRADE NAME	Harman-Kardon Model T-10
MANUFACTURER	Harman-Kardon, Inc., 520 Main St., Westbury, L.I., N.Y.
TYPE SET	AC Operated FM-AM Tuner
TUBES (Seven)	Types 12AT7 FM RF Amp.-Mixer, 12AT7 FM Osc.-AFC, 6BE6 AM Converter, 6BA6 1st. IF Amplifier, 6AU6 2nd. FM IF Amp.-AM Det., 6AU6 Limiter, 6AL5 Discriminator
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .33 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	535KC-1650KC

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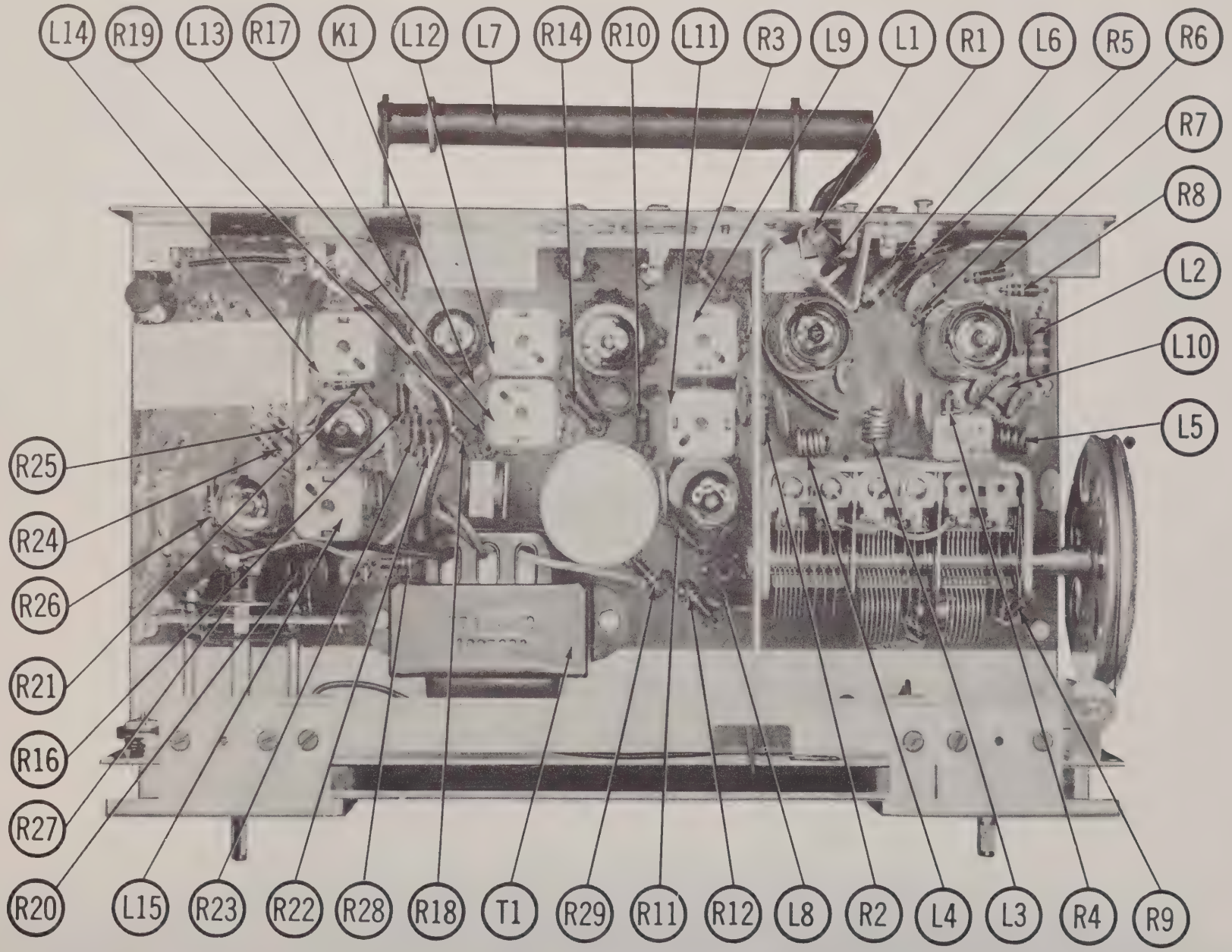
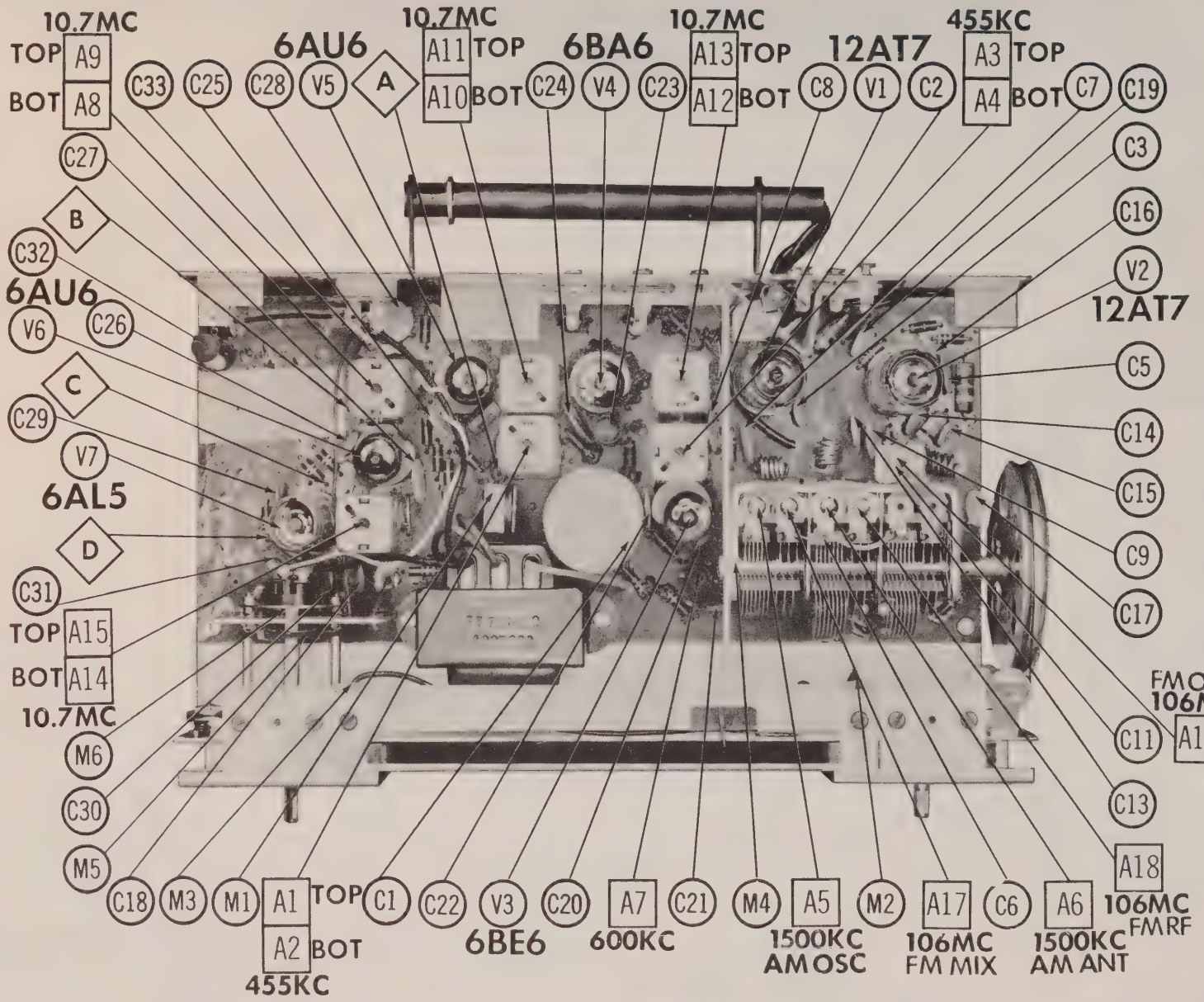


CHASSIS TOP VIEW — RESISTOR IDENTIFICATION



CHASSIS TOP VIEW — CAPACITOR & ALIGN. IDENTIFICATION

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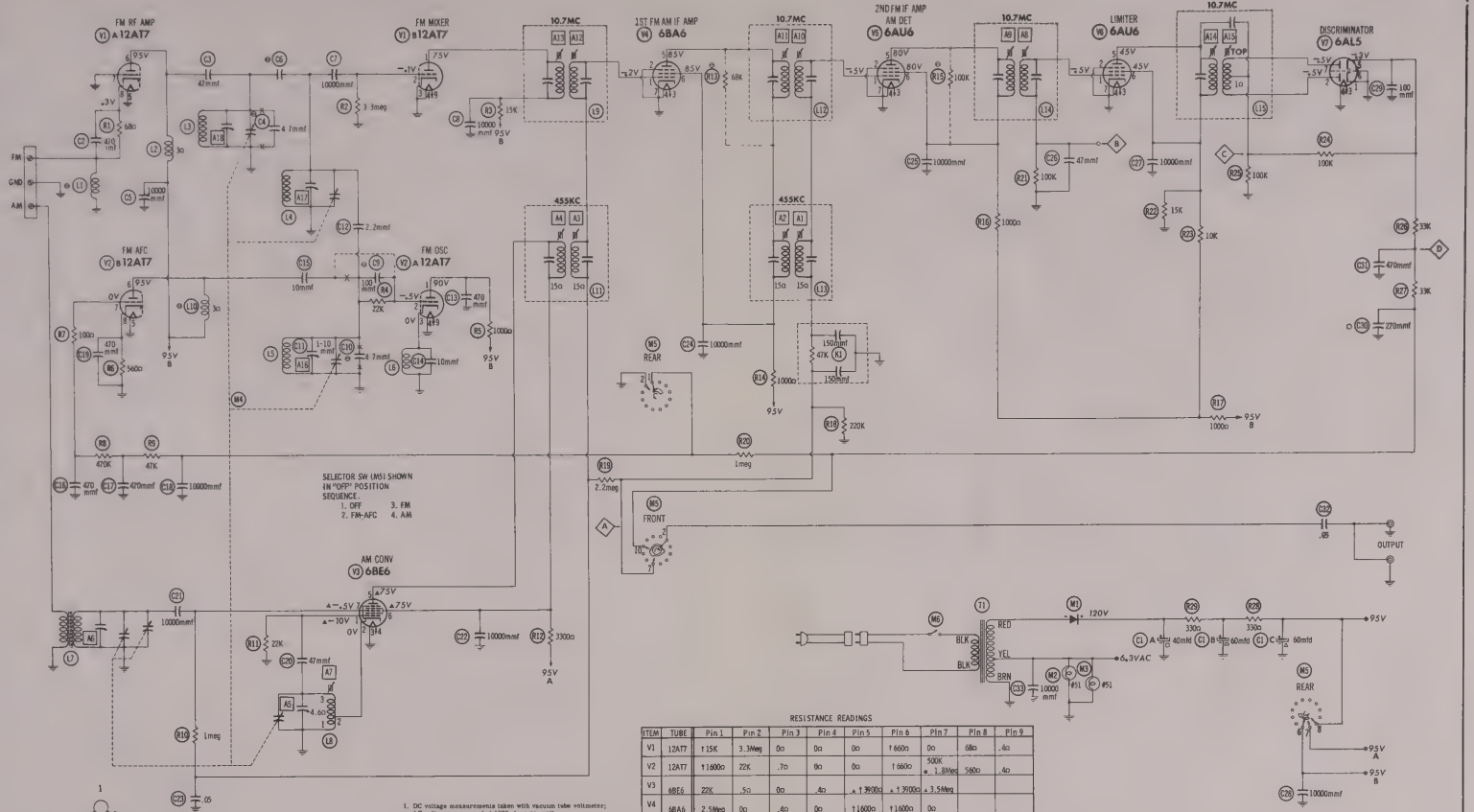
HARMAN-KARDON
MODEL T-10



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	↑15K	3.3Meg	0Ω	0Ω	0Ω	↑660Ω	0Ω	68Ω	.4Ω
V2	12AT7	↑1600Ω	22K	.7Ω	0Ω	0Ω	↑660Ω	500K ▪ 1.8Meg	560Ω	.4Ω
V3	6BE6	22K	.5Ω	0Ω	.4Ω	▲↑3900Ω	▲↑3900Ω	▲3.5Meg		
V4	6BA6	2.5Meg	0Ω	.4Ω	0Ω	↑1600Ω	↑1600Ω	0Ω		
V5	6AU6	260K	0Ω	.4Ω	0Ω	↑2600Ω	↑2600Ω	0Ω		
V6	6AU6	100K	0Ω	.4Ω	0Ω	↑11K	↑11K	0Ω		
V7	6AL5	0Ω	100K	.4Ω	0Ω	200K	0Ω	100K		

MEASURED IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
▲ MEASURED IN "AM" POSITION.
▪ MEASURED IN "FM-AFC" POSITION.
↑ MEASURED FROM OUTPUT M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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350-6

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to AM RF stator lug on tuning gang. Low side to chassis.	455KC (400∿Mod)	AM	1600KC	DC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Direct	High side to AM antenna terminal. Low side to chassis.	1500KC	"	1500KC	"	A5, A6	"
3.	"	"	600KC	"	600KC	"	A7	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to FM RF stator lug on tuning gang. Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point (B). Common to chassis.	A8, A9, A10, A11 A12,A13	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A14	"
6.	"	"	"	"	"	DC probe to point (D). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to FM RF stator lug on tuning gang. Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (B). Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A14	"
6.	"	"	"	"	"	Vert. Amp. to point (D). Low side to chassis.	A15	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω Carbon Resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	106MC	FM	106MC	DC probe to point (B). Common to chassis.	A16, A17, A18	Adjust for maximum deflection.
8.	"	"	90MC	"	90MC	"	L3, L4, L5	Adjust for maximum deflection by compressing or expanding coil turns.

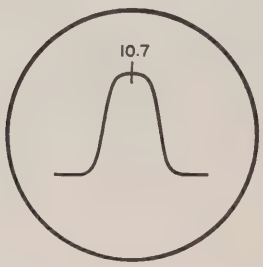


FIG. 1

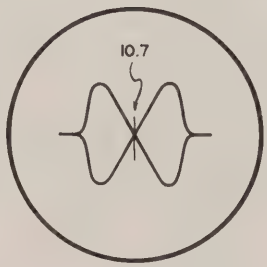


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp. -Mixer	12AT7	
V2	FM Osc. -AFC	12AT7	
V3	AM Converter	6BE6	
V4	1st. IF Amplifier	6BA6	
V5	2nd. FM IF Amp. -AM Det.	6AU6	
V6	Limiter	6AU6	
V7	Discriminator	6AL5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■40	150	JE781436C	AFH4-35					TVL-3443.2
B	▲60	150							
C	▲60	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C3	47			N750-SI 47	TCN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	
C4	4.7									Note 2
C5	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C6	.68				TCZ-R68					Note 1
C7	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C8	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C9	100			N750-SI 100	TCN-100	C10Q1U	TC7-100	NT-531	5TCU-T1	
C10	4.7									Note 2
C11	1-10		JV20688							Note 2
C12	2.2			NP0-SI 2.2	TCZ-2R2	C10V47C	TCO-2.2		5TCCB-V22	
C13	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C14	10			N750-SI 10	TCN-10	C10Q1U	TC7-10	NT-541	5TCU-Q1	
C15	10			N750-SI 10	TCN-10	C10Q1U	TC7-10	NT-541	5TCU-Q1	
C16	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C17	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C18	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C19	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C20	47			N750-SI 47	TCN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	
C21	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C22	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C23	.05	200				BC2S47J			2SE-S47	
C24	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C25	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C26	47			N750-SI 47	TCN-47	C10Q47U	TC7-47	NT-5447	5TCU-Q47	
C27	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C28	10000			BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C29	100			N750-SI 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	
C30	270			BPD-00027	DD-271	L10T27	ED-270	UC-5327	5GA-T27	Note 3
C31	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C32	.05	200				BC2S47J			2SE-S47	
C33	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	

Note 1. Some versions may use 1.2MMF in this application.
Note 2. Not used in some versions.
Note 3. Some versions may use 470MMF in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Harman-Kardon PART No.	IRC PART No.	
R1	68Ω			BTS-68	
R2	3.3Meg			BTS-3.3Meg	
R3	15K			BTS-15K	
R4	22K			BTS-22K	Note 1
R5	1000Ω			BTS-1000	
R6	560Ω			BTS-560	
R7	100Ω			BTS-100	
R8	470K			BTS-470K	
R9	47K			BTS-47K	
R10	1Meg			BTS-1Meg	
R11	22K			BTS-22K	
R12	3300Ω			BTS-3300	
R13	68K			BTS-68K	Note 2
R14	1000Ω			BTS-1000	
R15	100K			BTS-100K	Note 2
R16	1000Ω			BTS-1000	
R17	1000Ω			BTS-1000	
R18	220K			BTS-220K	
R19	2.2Meg			BTS-2.2Meg	
R20	1Meg			BTS-1Meg	
R21	100K			BTS-100K	
R22	15K			BTS-15K	
R23	10K			BTS-10K	
R24	100K			BTS-100K	
R25	100K			BTS-100K	
R26	33K			BTS-33K	
R27	33K			BTS-33K	
R28	330Ω			BTS-330	
R29	330Ω			BTS-330	

Note 1. Some versions may use 10K in this application.
Note 2. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.33A	120VAC @.037A tap @ 6.3V @ 2.45A			FT781419B					

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Harman-Kardon PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil					.24 Microhenry - Note 1 - IRC part #CLA
L2	RF Choke				4608	3.3 Microhenries IRC part #CLA
L3	FM RF Coil	GL781543				
L4	FM Mixer Coil	GL781543				
L5	FM Osc. Coil	GL781544				
L6	RF Choke		19-1000		4602	1 Microhenry - IRC part #CLA
L7	Loop Stick	GL781479A				183 Microhenries - Note 2
L8	AM Osc. Coil					
L9	1st. FM IF	GT781491A				
L10	RF Choke				4608	3.3 Microhenries - Note 1 - IRC part #CLA
L11	1st. AM IF	GT781493A			13-PC1	
L12	2nd. FM IF	GT781491A				
L13	2nd. AM IF	GT781493A			13-PC1	
L14	FM Limiter	GT781491A				
L15	Discriminator	GT781492A				

Note 1. Some versions use a 1 microhenry coil in this application.
Note 2. Loop stick includes tuning ring, part #P481329A.

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Harman-Kardon PART No.	REPLACEMENT DATA	
K1	AM Detector RF Filter	47K, 150MMF, 150MMF		Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-98 PC-51 111TM2 1403-02 D-2

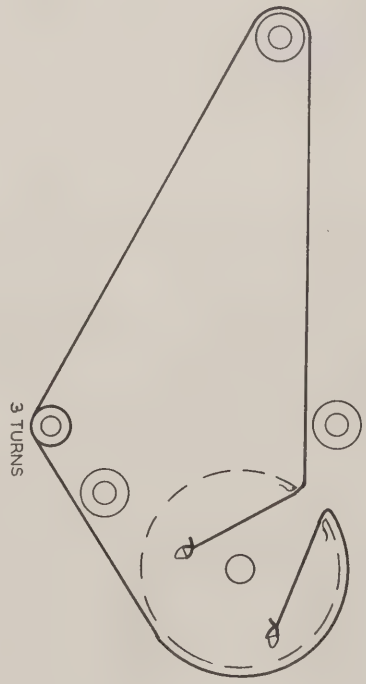
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Harman-Kardon PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.037A			RS065Q		8J1B	50	

MISCELLANEOUS

ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M2	Dial Lamp		#51
M3	Dial Lamp		#51
M4	Tuning Cap.	JV781468D	6 Gang
M5	Switch	ER781480C	Function
M6	Switch		On-off
	Glass	P781415C	Dial
	Pointer	Z781482A	Dial
	Knob	P351043	Function
	Knob	P20778	Tuning
	Cabinet	P781414C	

DIAL CORD STRINGING



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DENVER, CO...

KNIGHT
MODELS 94SX700, 94SX708

KNIGHT
MODELS 94SX700, 94SX708

TRADE NAME	Knight Models 94SX700, 94SX708
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill.
TYPE SET	AC Operated 6 Channel 12 Watt Audio Amplifier
TUBES (Six)	Types 12AX7 (or) 12AD7 Preamplifier, 12AX7 Cath. Follower-1st. AF Amp., 12AX7 2nd. AF Amp.-Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	105-130 Volts AC-50/60 cycles RATING .66 Amp. @ 117 Volts AC

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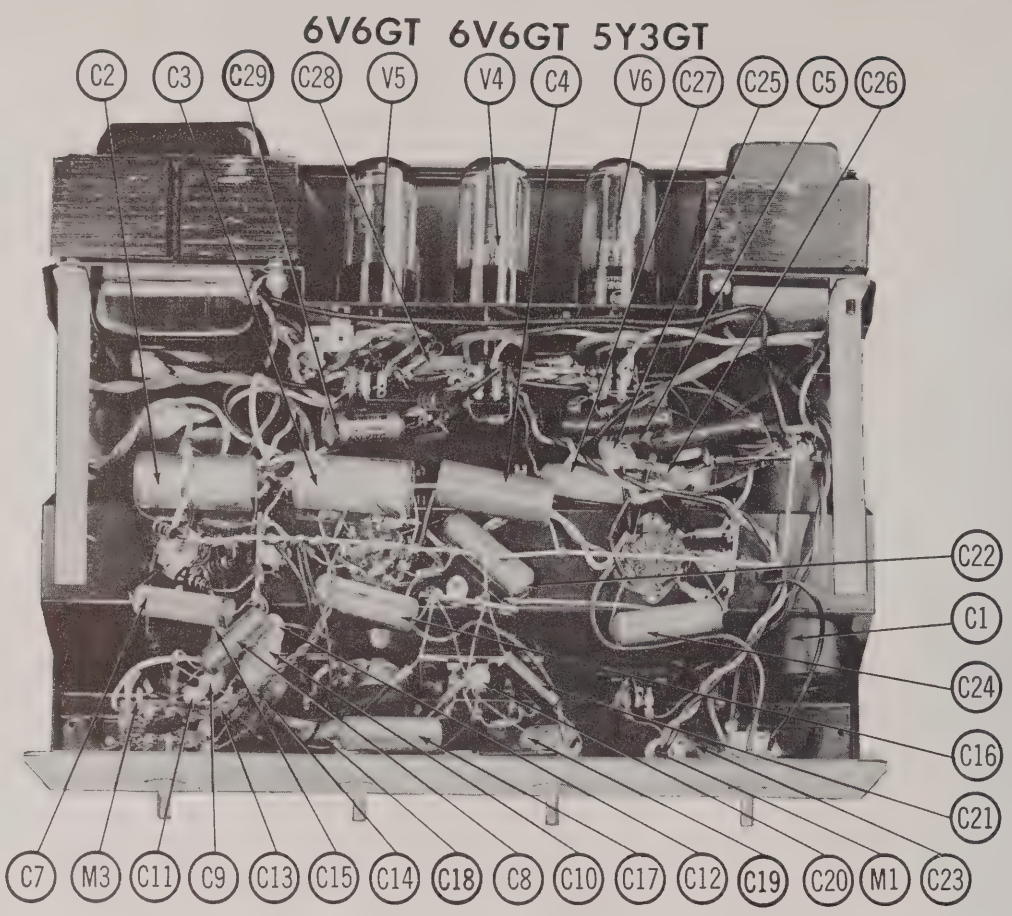
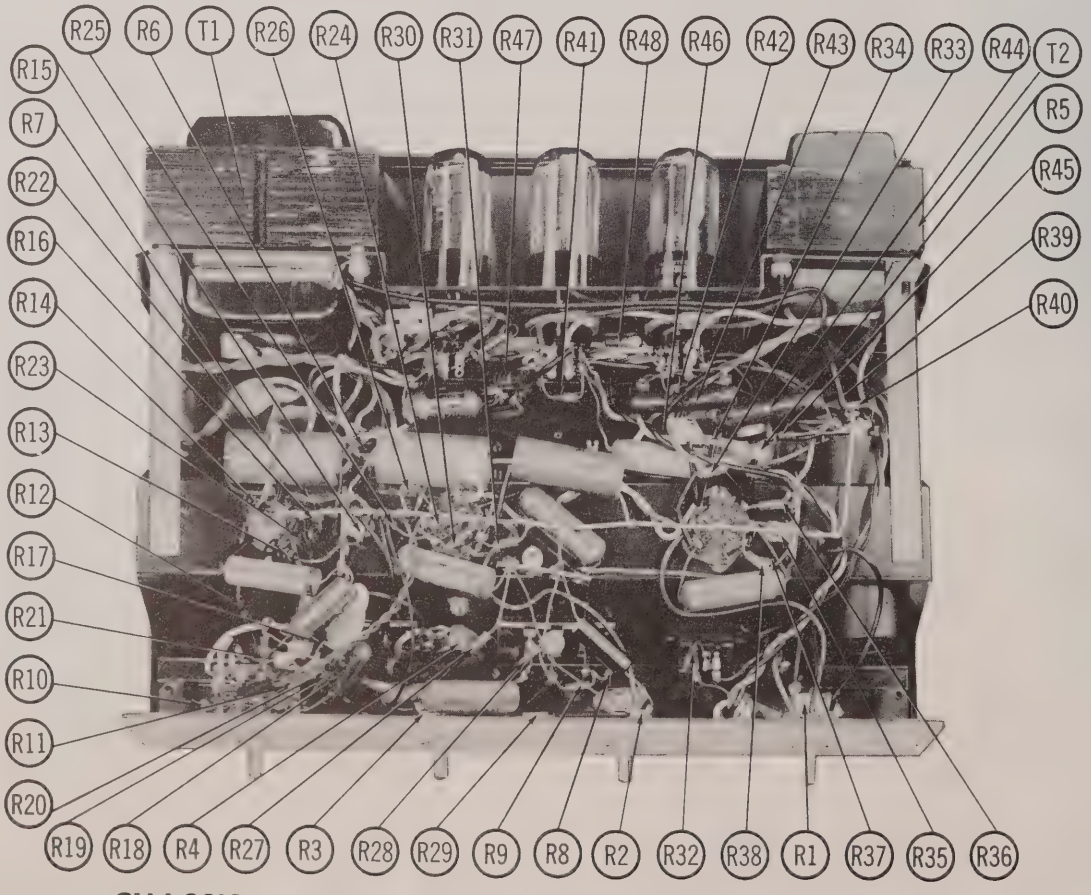


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	12AX7	Note 1
V2	Cath. Follower-1st. AF Amp.	12AX7	
V3	2nd. AF Amp. -Phase Inv.	12AX7	
V4	Output	6V6GT	
V5	Output	6V6GT	
V6	Rectifier	5Y3GT	

Note 1. Type 12AD7 used in Model 94SX708.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450		AFH4-17	DO160	FP475.5	TMQ-17	Q-055	TVL-4771.3
B	■10	450							
C	▲10	450							
D	10	450							
C2	8	450		PRS450V8	BR845	TC71	TD-8-450	FM-4508	TVA-1704
C3	8	450		PRS450V8	BR845	TC71	TD-8-450	FM-4508	TVA-1704
C4	35	50		PRS150V40	BR505	TC39	TD-50-50	FM-0550	TVA-1308
C5	35	50		PRS150V40	BR505	TC39	TD-50-50	FM-0550	TVA-1308
C6	8	450	(Note 1)	PRS450V8	BR845	TC71	TD-8-450	FM-4508	TVA-1704

Note 1. Used in Model 94SX708 only.

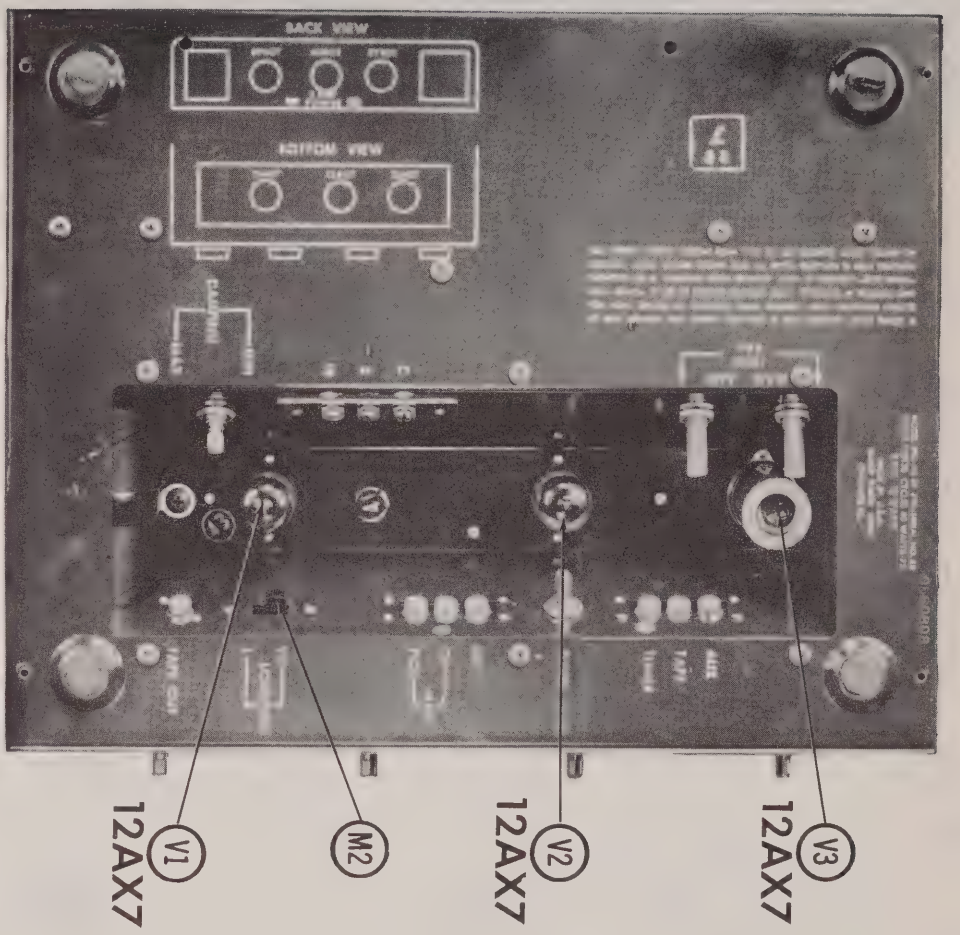
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	.033	600		BPD-03	DF-303	CUB6S33		GEM-6133	6TM-S33	
C8	.01	600		BPD-01	DD-103	CUB6S1		GEM-611	6TM-S1	
C9	270			SI270	DD-271	L10T27	ED-270	UC-5327	5GA-T27	
C10	4700			BPD-0047	D6-472	BYA10D47	GP-4700	UC-5247	5HK-D47	
C11	560			BPD-00056	DD-561	BYA10T56	ED-560	UC-5356	5GA-T56	
C12	2200			BPD-0022	D6-222	BYA10D22	GP-2200	UC-5222	5GA-D22	
C13	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C14	.0068	600		BPD-0068	D6-682	CUB6D68	GP-6800	GEM-6268	6TM-D68	
C15	.01	600		BPD-01	DD-103	CUB6S1	GP-10000	GEM-611	6TM-S1	Note 2
C16	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C17	.0056	600		BPD-0056	D6-562					
C18	.056	600								
C19	15			1469-000015		5R5Q15			MS-415	
C20	330			BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C21	.0033	600		BPD-0033	D6-332	CUB6D33	GP-3300	GEM-6233	6TM-D33	
C22	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C23	.01	600		BPD-01	DD-103	CUB6S1		GEM-611	6TM-S1	
C24	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C25	47			1469-000047		5R5Q47			MS-447	
C26	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C27	.047	600		BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C28	100			1469-0001		5R5T1			MS-31	
C29	.02	600		BPD-02	DD-203	CUB6S2		GEM-612	6TM-S2	

Note 2. Model 94SX708 uses .1MFD in this application.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½		BT-63	A47F4-500K	Q18-133X	UT-429	Volume - Tap ⓐ 50K
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2A	500K	½		AB-60	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R3A	500K	½		AB-60	A47-500K-Z	Q13-133	U48	Bass
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R4A	500K	½		AB-60	A47-500K-Z	Q13-133	U48	Tuner Level
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R5A	500Ω	½						Damping
B	Shaft							
C	Switch							
R6A	200Ω	1		VK-123	A43-200	VPK200	R250L	Hum balance amp. - wire wound
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	
R7A	200Ω	1		VK-123	A43-200	WPK-200	R250L	Hum balance Mag. - wire wound
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KNIGHT PART No.	IRC PART No.	
R8	27K			BTS-27K	
R9	22K			BTS-22K	
R10	470K			BTS-470K	
R11	150K			BTS-150K	Note 1
R12	100K			BTS-100K	
R13	220K 5%			BTS-220K 5%	
R14	1500Ω 5%			BTS-1500 5%	
R15	22K			BTS-22K	Note 2
R16	470K			BTS-470K	
R17	100K			BTS-100K	
R18	68K			BTS-68K	Note 3
R19	68K			BTS-68K	
R20	68K			BTS-68K	
R21	68K			BTS-68K	
R22	47K 5%			DCC-47K 5%	Note 4
R23	1500Ω 5%			BTS-1500 5%	
R24	3.3Meg			BTS-3.3Meg	
R25	22K			BTS-22K	
R26	22K			BTS-22K	
R27	47K			BTS-47K	
R28	4700Ω			BTS-4700	
R29	47K			BTS-47K	
R30	220K			BTS-220K	
R31	1500Ω			BTS-1500	
R32	22K			BTS-22K	
R33	270K			BTS-270K	
R34	3000Ω 5%			BTS-3000 5%	
R35	470K			BTS-470K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KNIGHT PART No.	IRC PART No.	
R36	47K			BTS-47K	
R37	680Ω			BTS-680	
R38	47K			BTS-47K	
R39	4700Ω			BTS-4700	
R40	4700Ω			BTS-4700	
R41	470K			BTS-470K	
R42	470K			BTS-470K	
R43	300Ω	4		PW4-300	Note 5
R44	3Ω	10		PW10-3	
R45	47Ω 5%			BTS-47	
R46	270Ω 5%	1		BTA-270	
R47	2200Ω	2		BTB-2200	
R48	4.7Ω			BW½-4.7	Note 6

Note 1. 470K used in Model 94SX708 only.
Note 2. 100K used in Model 94SX708 only.
Note 3. 3300Ω used in Model 94SX708 only.
Note 4. 220K used in Model 94SX708 only.
Note 5. Some versions may use 350Ω in this application.
Note 6. 6.8Ω used in Model 94SX708 only.

TRANSFORMER (POWER)

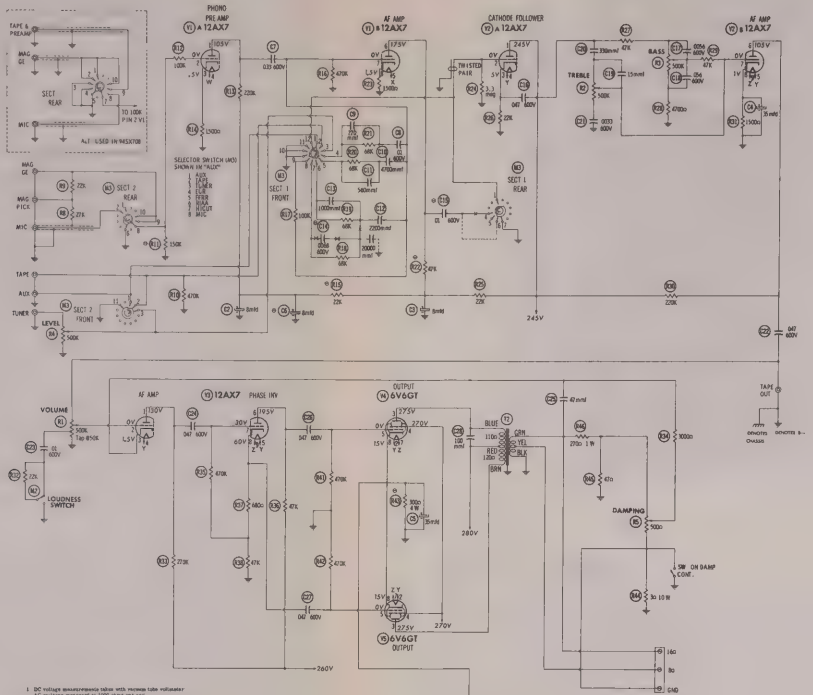
ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	130VAC tap ⓐ 117VAC ⓐ .66A	655VCT ⓐ.075A	5VAC ⓐ3A	10.6VAC ⓐ.19A SEC. 4 6.3VAC ⓐ1.75A	LP-0248					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7600Ω CT	16Ω tap ⓐ 8Ω	LO-0136-H						

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M1	Dial Lamp		#47
M2	Switch		Loudness, Slide type (SPDT)
M3	Switch		Function Selector, wafer type (2 gang)


PHONO PRE AMP V1 a 12AX7
AF AMP V1 b 12AX7
CATHODE FOLLOWER V7 a 12AX7
AF AMP V2 12AX7
TAPE & PREAMP
MAG GE
SECT REAR
MIC
ALL USED IN MASTOR
TO 100K PIN 2 V1
SELECTOR SWITCH (AS SHOWN IN "AUX")
1 AUX
2 TUNER
3 LEV
4 TAPE
5 MAG PICK
6 MAG GE
7 MIC
SECT 1 FRONT
SECT 2 REAR
SECT 1 REAR
MAG PICK
TAPE
AUX
TUNER
LEVEL
SECT 2 FRONT
TREBLE
BASS
TAPE OUT
AF AMP V3 12AX7 PHASE INV
OUTPUT V4 6V6GT
VOLUME
LOUDNESS SWITCH
DAMPING
SW ON DAMP CONT
OUTPUT V5 6V6GT
T1
RECT V6 5Y3GT
SW. ON VOL CONT
HUM BALANCE
RESISTANCE READINGS
ALL MEASUREMENTS TAKEN IN "AUX" POSITION.
MEASURED FROM PIN 8 OF V6.
NC NO CONNECTION.
TP TIE POINT
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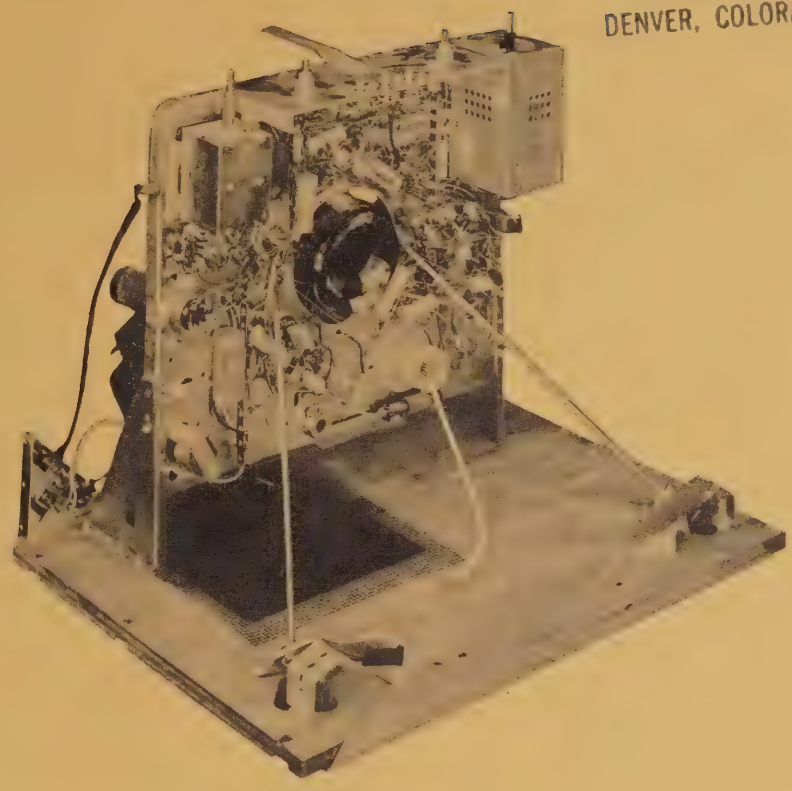

MAGNAVOX CHASSIS CMUA487AA

TRADE NAME	Magnavox	CHASSIS
		CMUA/CTA 487AA, BB, CC, 488AA, 489AA, 490AA, BB, CC, 491AA, BB, CC, 492AA, 496BB, 497BB, 499BB, CC, 501BB, CC ..... 117 Series
		CMUD/CTD 495AA, BB, CC ..... 117 Series
		CMUE/CTE 493AA, BB, CC, 494AA, BB ..... 117 Series
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana	
TYPE SET	Television Receiver	
TUBES	Twenty-one	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 1.64 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)	

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MAGNAVOX CHASSIS CMUA/CTA487AA, BB, CC, 488AA, 489AA, 490AA, BB, CC, 491AA, BB, CC, 492AA, 496BB, 497BB, 499BB, CC, 501BB, CC, CMUD/CTD495AA, BB, CC, CMUE/CTE493AA, BB, CC, 494AA, BB (117 Series)

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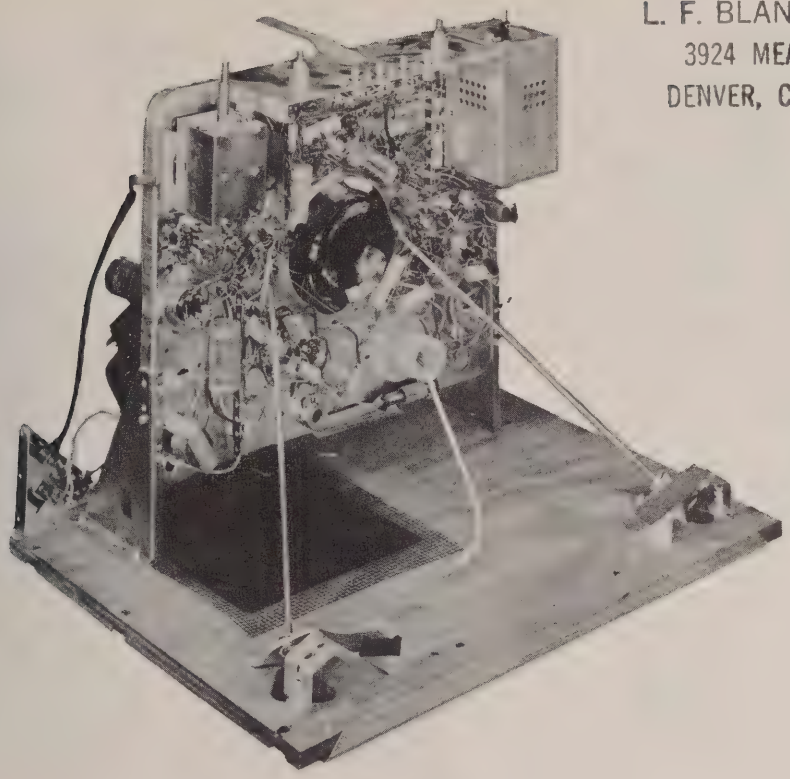

CHASSIS

CMUA487AA ..... 117 Series

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

FOCUS

Focus may be varied in steps by position of plug in focus adjustment board. Readjust ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the discriminator secondary (A13) location on top of chassis.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tubes until the picture is properly centered.

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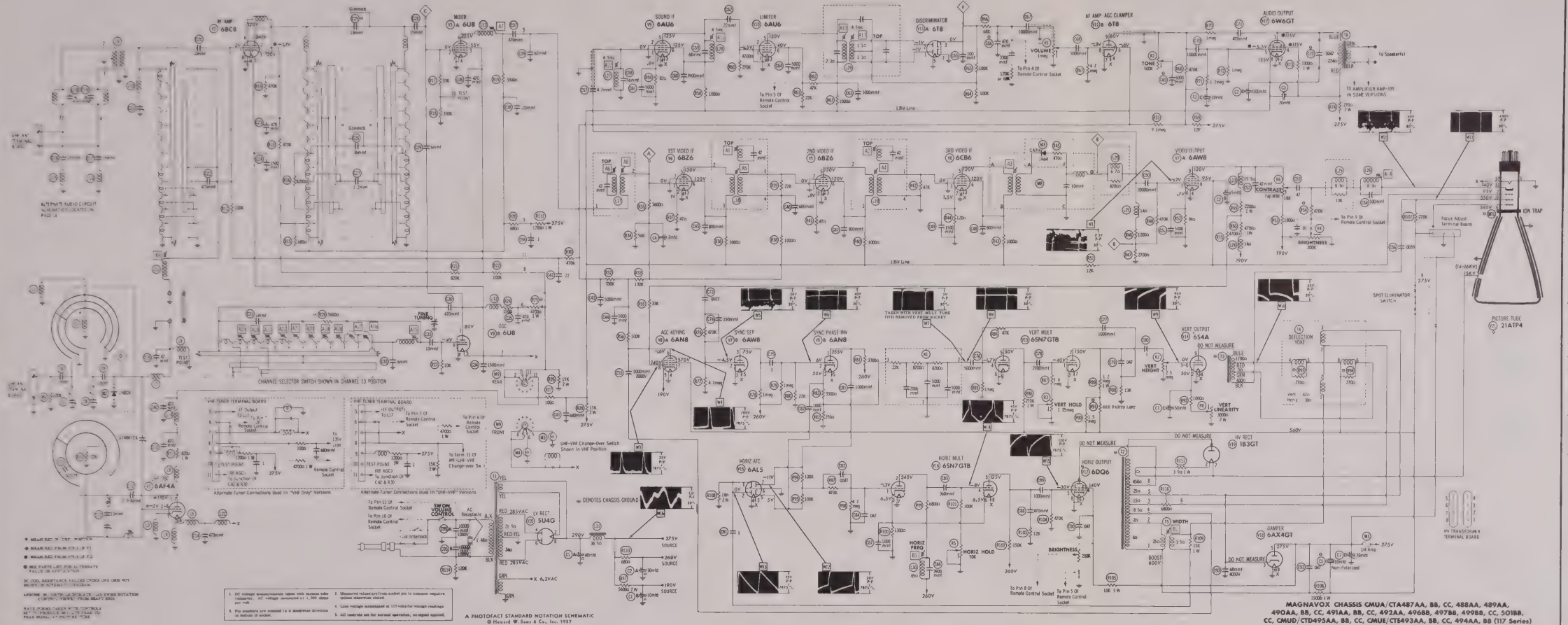
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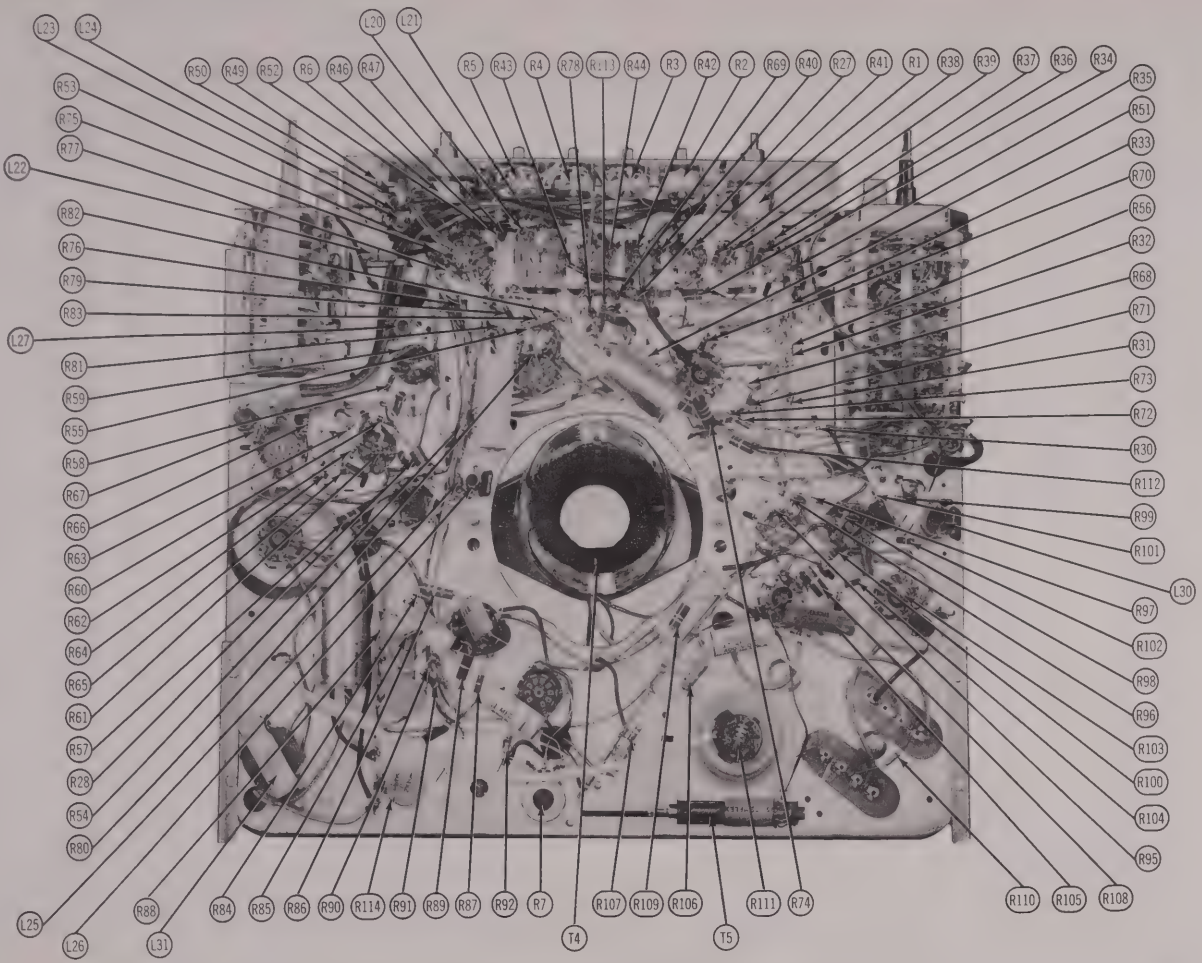

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART

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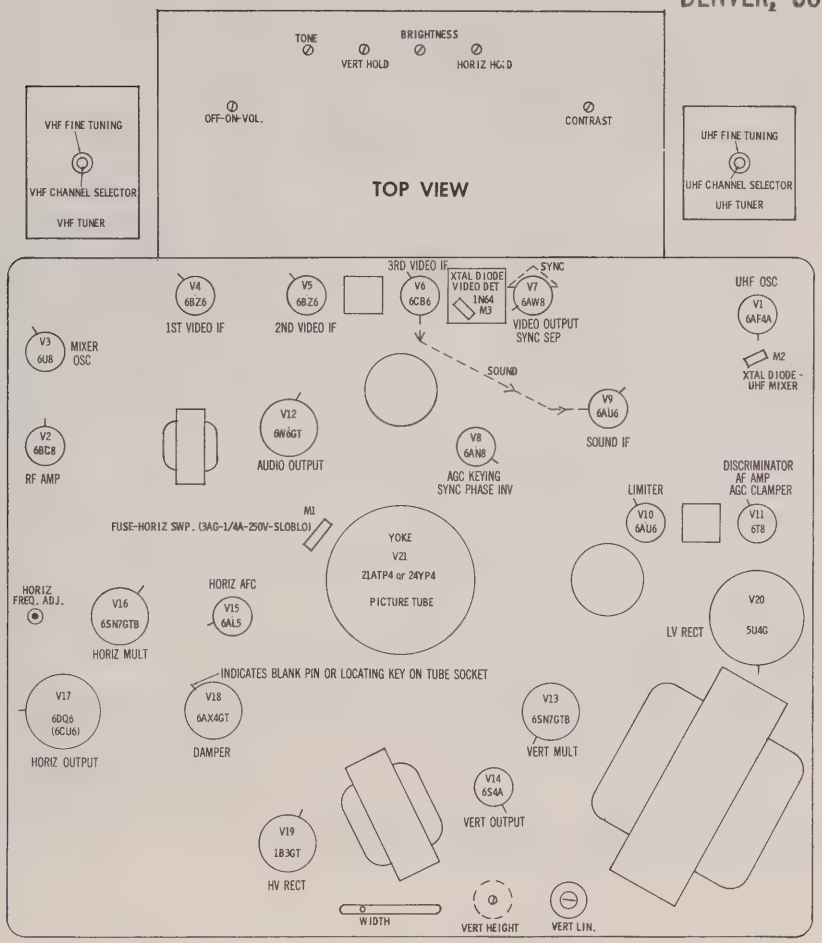


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V20

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V4, V5, V6, Diode (M3), V12
No pic, no sound, has snow - V2, V3, (UHF) V1, Diode (M2)
No pic, has sound, has raster - V7, V21
Has pic, no sound - V9, V10, V11, V12
Overloaded picture - V8, V11

SYNC FAILURE
No vert. sync - V7, V8, V13
No horiz. sync - V7, V8, V15, V16
No vert. or horiz. sync - V7, V8

SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V19, V21, Fuse (M1)
No vertical deflection - V13, V14
Poor vert. linearity or foldover - V13, V14
Poor horiz. linearity or foldover - V16, V17, V18
Narrow picture - V16, V17, V18, V20
Vert. off freq. - V7, V8, V13
Horiz. off freq. - V7, V8, V15, V16

MAGNAVOX CHASSIS CMUA/CTA487AA, BB, CC, 488AA, 489AA, 490AA, BB, CC, 491AA, BB, CC, 492AA, 496BB, 497BB, 499BB, CC, 501BB, CC, CMUD/CTD495AA, BB, CC, CMUE/CTE493AA, BB, CC, 494AA, BB (117 Series)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Allow 10 to 20 minutes warm-up time for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C4. Connect the negative lead of a 1.5 volt bias supply to the ungrounded side of C42. Connect the positive leads to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MMF	High side to point Ⓐ. Low side to chassis.	43MC (10MC Swp)	47.25MC	Any unused channel.	Vert. amp. thru 10K to point Ⓑ. Low side to chassis.	A1, A2	Adjust sweep so that 47.25MC trap is visible. Adjust A1 and A2 to place marker in trap notch as in Fig. 1. This may be done with slugs at two positions. Use position with slug farthest out of coil form.
2.	"	"	"	42.25MC 45.0MC 45.75MC	"	"	A3, A4, A5	Adjust for response similar to Fig. 2 with markers as indicated. Adjust A3 for maximum gain between 42.25MC and 45.75MC. Adjust A4 to place 45.75MC marker at 50% on the curve. Adjust A5 to place 42.75MC marker at 50% on opposite side of curve. Recheck 47.25MC traps.
3.	"	High side to point Ⓒ. Low side to chassis.	"	41.25MC	"	"	A6	Adjust sweep so that 41.25MC trap is visible. Adjust A6 to place 41.25MC marker in trap notch as in Fig. 3. This may be done with slug in two positions. Use position with slug farthest from chassis.
4.	"	"	"	42.25MC 45.0MC 45.75MC	"	"	A7, A8	Adjust A7 for maximum gain with 45.75MC marker at 50% as in Fig. 2. Adjust A8 if necessary for maximum response and proper tilt. Interaction between A7 and A8 may require repeating these two adjustments. Recheck step 3.
5.	1000Ω carbon resistor	High side to point Ⓓ. Low side to chassis.	"	"	UHF	"	A9	Adjust for response similar to Fig. 2 with MINIMUM tilt.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.005MFD	High side to point Ⓔ. Low side to chassis.	4.5MC (unmod)	Any unused channel.	DC probe to point F thru 10K. Common to chassis.	A10, A11, A12	Adjust for maximum deflection. Use only enough generator output to provide usable indication on VTVM.
7.	"	"	"	"	"	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

Tune in a TV station and turn the fine tuning slowly clockwise until 4.5MC interference pattern becomes visible. Adjust A14 until horizontal scanning lines become smooth and continuous.

FIG.1

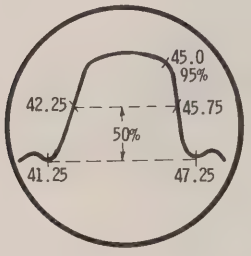


FIG.2

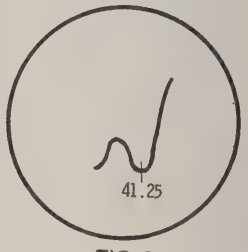


FIG.3

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the fine tuning control to the mid-position of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Fig. 4	Across VHF antenna terminals thru matching network (Fig. 4).	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 47K to point (B). Low side to chassis.	A15	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should fall at 50%.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A16	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A17	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A18	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A19	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A20	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A21	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A22	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A23	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A24	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A25	

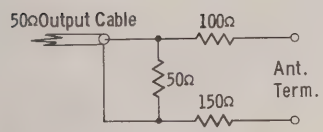


FIG.4

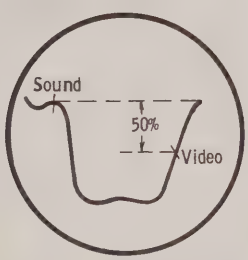
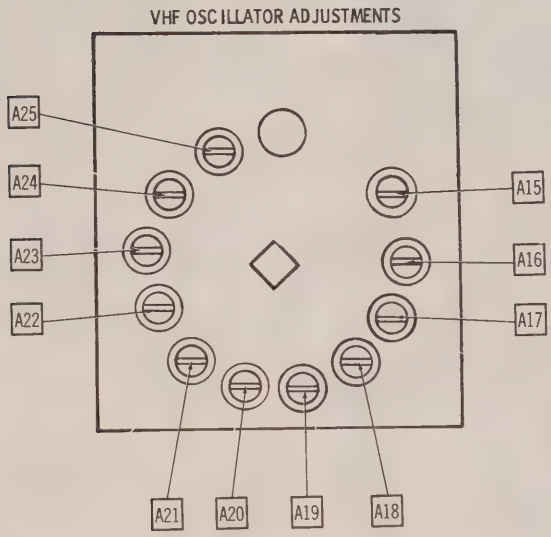
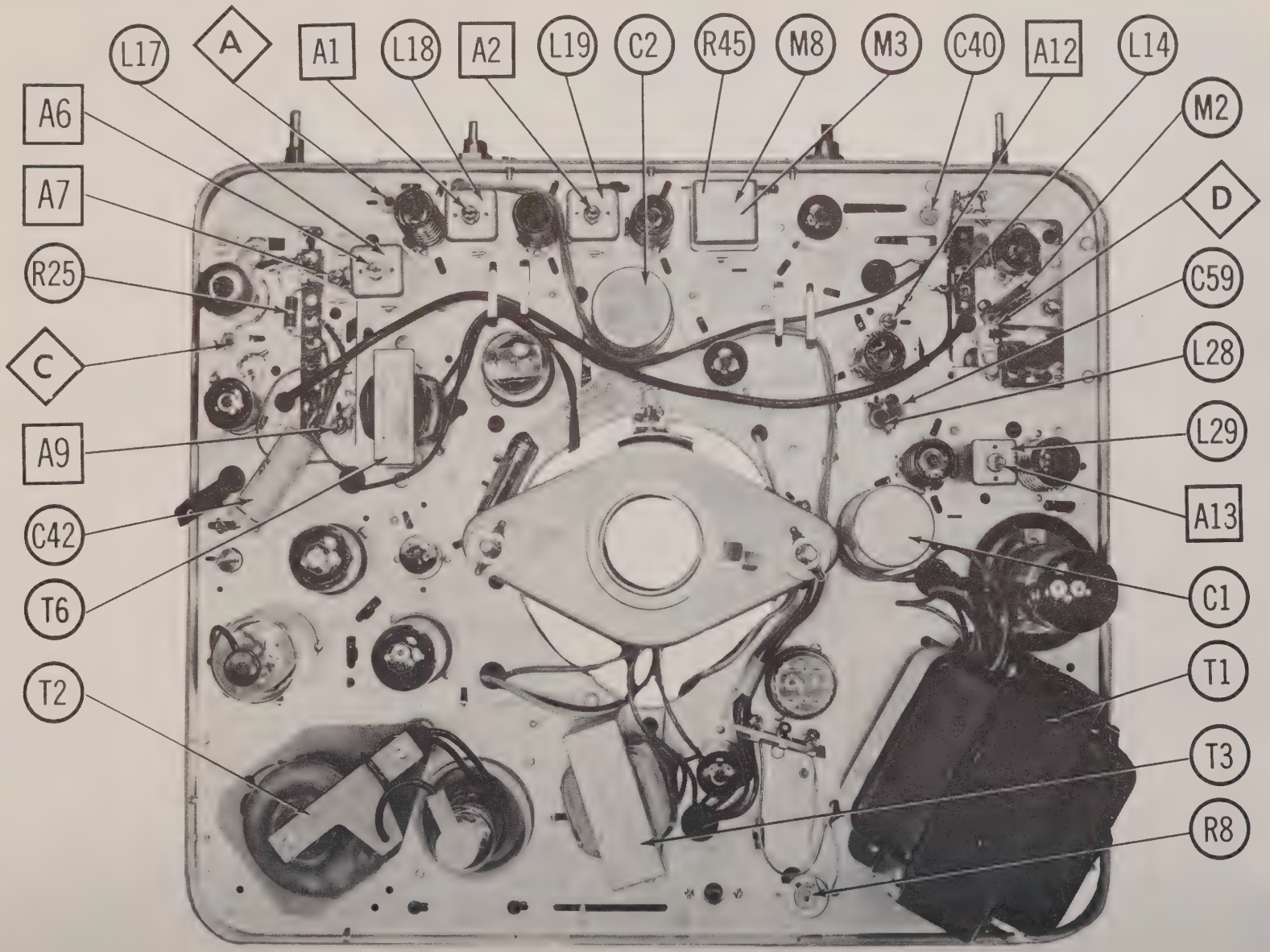


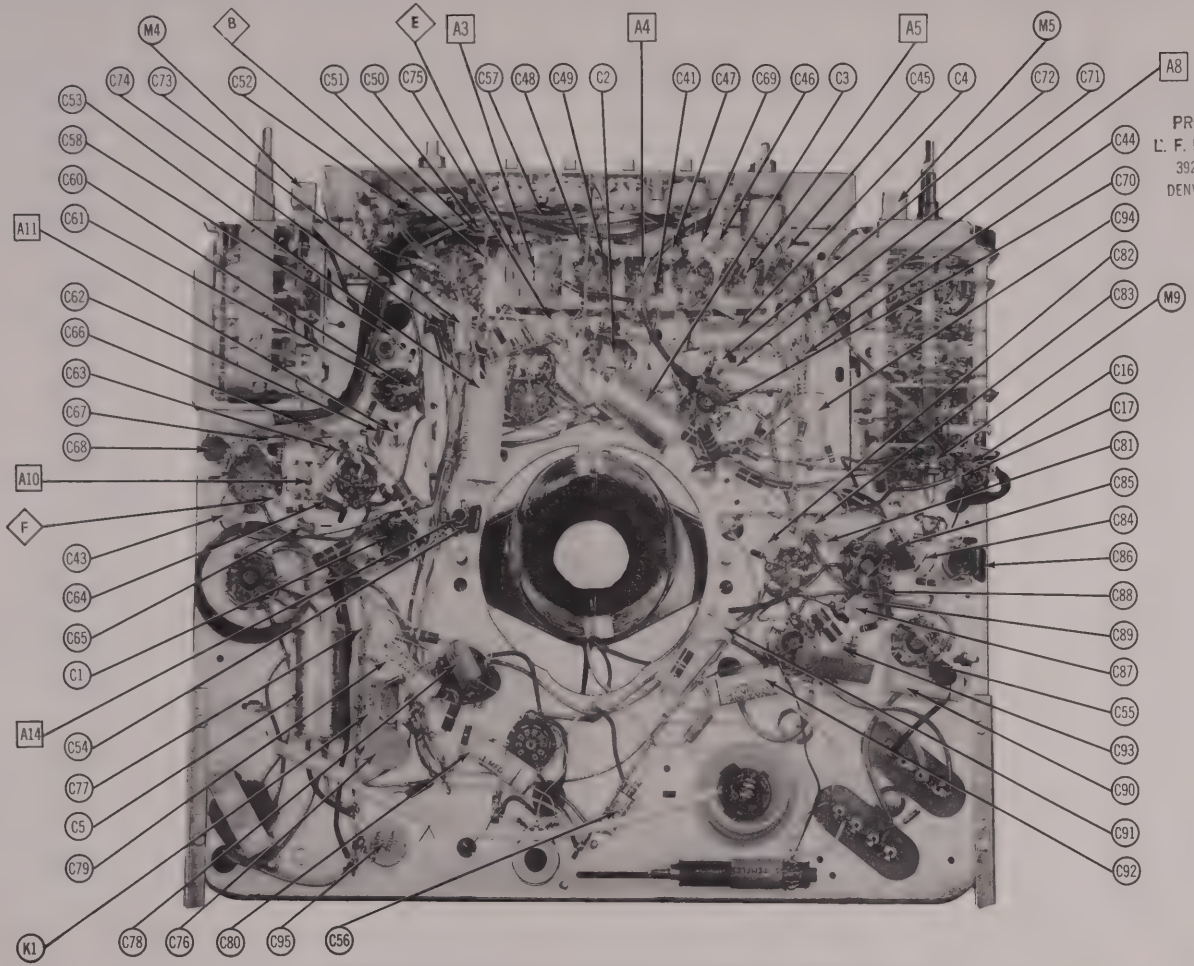
FIG.5



MAGNAVOX CHASSIS CMUA/CTA487AA, BB, CC, 488AA, 489AA, 490AA, BB, CC, 491AA, BB, CC, 492AA, 496BB, 497BB, 499BB, CC, 501BB, CC, CMUD/CTD495AA, BB, CC, CMUE/CTE493AA, BB, CC, 494AA, BB (117 Series)



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

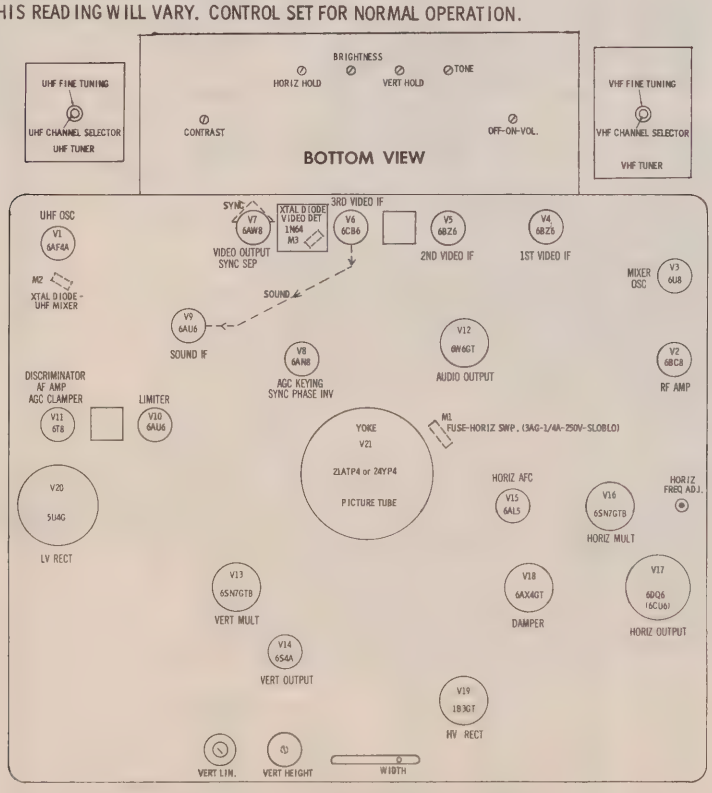
MAGNAVOX CHASSIS CMUA/CTA487AA, BB, CC, 488AA, 489AA, 490AA, BB, CC, 491AA, BB, CC, 492AA, 496BB, 497BB, 499BB, CC, 501BB, CC, CMUD/CTD495AA, BB, CC, CMUE/CTE493AA, BB, CC, 494AA, BB (117 Series)

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AF4A	■ *920Ω	22K	0Ω	.1Ω	.1Ω	22K	■ *920Ω		
V2	6BC8	† 2000Ω	220K	INF	0Ω	.1Ω	INF	1Meg	0Ω	0Ω
V3	6U8	■ 5000Ω	360K	100K	0Ω	.1Ω	† 5100Ω	0Ω	0Ω	10K
V4	6BZ6	59K	47Ω	.1Ω	0Ω	■ 1000Ω	■ 1000Ω	0Ω		
V5	6BZ6	57K	47Ω	.1Ω	0Ω	■ 1000Ω	■ 1000Ω	0Ω		
V6	6CB6	.1Ω	120Ω	.1Ω	0Ω	■ 1000Ω	■ 1000Ω	0Ω		
V7	6AW8	0Ω	4.7Meg	† 1Meg	0Ω	.1Ω	39Ω	470K	■ 12K	† 12K
V8	6AN8	† 4000Ω	22K	3600Ω	0Ω	.1Ω	280K	‡ 1500Ω		
V9	6AU6	.4Ω	0Ω	.1Ω	0Ω	■ 1000Ω	■ 1000Ω	82Ω		
V10	6AU6	270K	0Ω	.1Ω	0Ω	■ 1000Ω	■ 48K	0Ω		
V11	6T8	100K	100K	200K	.1Ω	0Ω	470K	0Ω	4.7Meg	† 480K
V12	6W6GT	TP	.1Ω	† 500Ω	† 3500Ω	550K	TP	0Ω	10K	
V13	6SN7GTB	● 1.8Meg	‡ 1.7Meg	0Ω	1Meg	‡ 270K	0Ω	.1Ω	0Ω	
V14	6S4A	NC	● 2300Ω	● 1.7Meg	.1Ω	0Ω	● 1.7Meg	NC	NC	‡ 3300Ω
V15	6AL5	18Ω	18Ω	.1Ω	0Ω	5Meg	0Ω	5Meg		
V16	6SN7GTB	4.7Meg	7500Ω	1300Ω	● 130K	150K	1300Ω	0Ω	.1Ω	
V17	6DQ6	TP	0Ω	TP	† 10K	470K	TP	.1Ω	0Ω	TOP CAP ‡ 25Ω
V18	6AX4GT	NC	NC	‡ 30Ω	NC	† 35Ω	NC	0Ω	.1Ω	
V19	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡ 475Ω
V20	5U4G	NC	20K	NC	22Ω	NC	24Ω	TP	20K	
V21	21ATP4	0Ω	■ 12K	Pin 6 ‡ 1500Ω	Pin 10 ‡ 270K	Pin 11 ● 550K	Pin 12 .1Ω			

* MEASURED IN "UHF" POSITION.
† MEASURED FROM PIN 8 OF V20.
■ MEASURED FROM PIN 8 OF V12.
‡ MEASURED FROM PIN 3 OF V18.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART

SET 350 FOLDER 8

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	UHF Osc.	6AF4A	
V2	RF Amplifier	6BC8	
V3	Mixer-Osc.	6U8	
V4	1st Video IF Amp.	6BZ6	
V5	2nd Video IF Amp.	6BZ6	
V6	3rd Video IF Amp.	6CB6	
V7	Video Output-Sync Separator	6AW8	
V8	AGC Keying-Sync Phase Inverter	6AN8	
V9	Sound IF Amp.	6AU6	
V10	Limiter	6AU6	

ITEM No.	USE	TYPE	NOTES
V11	Discriminator-AF Amp. - AGC Clamper	6T8	
V12	Audio Output	6W6GT	
V13	Vert. Mult.	6DN7GTB	
V14	Vert. Output	6S4A	
V15	Horiz. AFC	6AL5	
V16	Horiz. Mult.	6BN7GTB	
V17	Horiz. Output	6DQ6B	Note 1
V18	Damper	6AX4GT	
V19	HV Rectifier	1B3GT	
V20	1.V Rectifier	5U4G	

Note 1: 6CU5 may be used in some versions.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: MAGNAVOX PART No.	CBS	GENERAL ELECTRIC	SYLVANIA PART No.	NOTES
V31	21AUP4	21AUP4 ①	21AUP4, 21AUP4A ②	21AUP4A ② 21AUP4B ② 21AUP4C ② 24TP4 ②	① Aluminized ② Silver Screen "B"
	24TP4	24TP4 ①	24TP4 ①		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: MAGNAVOX PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	350	370281-53	RS1009	CG370	FP37L 5 TC63	T-175	FM-0380	TVL-4831
B	40	350			BH500				
C	80	50							
D	70	350							
C2A	30	350	370281-57	AFH4-56-93.4			QG-035		TVL-4824.7
B	3	350					D-115		
C	40	350							
D	100	300							
C3	30	350	370287-30	PR5450V30	BR3025	TC85	TD-30-350	FM-4530	TVA-1808
C4	3	50	370287-33	5RS50V3	BBR3-50	TC303	TD-2-50	MT-0303	TVA-1301
C5	10	350	370287-36 (Note 1)	NP-PR3550-VWDU	BR3035 † BBR3050 †	TC65 † TC66 †		MT-0310	R2337*

Note 1: Non-polarized unit.
† Consist of negative leads together.
• Use positive leads only.
* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	L.3									
C7			250188-10							
C8			250188-12							
C9	1		250331-114	MPO-S1 1	TCZ-1		TCO-1		5TCCB-V1	
C10	10									
C11	.02		250320-2							
C12	2.2-4		250178-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C13	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C14	470		250175-31	MT50-D147	TCN-47	C10Q47U	TCT-47	MT-5447	5TCU-Q47	
C15	15		250207-84	MPO-S1 15	TCZ-15	CTA10Q15U	TCO-15		5TCC-Q15	
C17	15		250207-84	MPO-S1 15	TCZ-15	CTA10Q15U	TCO-15		5TCC-Q15	
C18	39		250175-32	MT50-S139	TCN-39	C10Q39U	TCT-39			
C19	39		250175-20	MT50-SD39	TCN-39	C10Q39U	TCT-39			
C20	10		250321-127	RI 10	DE-100	LT76Q	GP-10		5GA-Q1	
C21			250188-8							
C22	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C23	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C24	1500		250175-10	BPD-0016	DD-152	BYA10D47	ED-0016	DC5216	SGA-D16	Note 2
C25	.18		250116-4							Note 3
C26	.56		250116-5							
C27	L.3		250321-115							
C28	15		250207-5	MPO-S15	DE-150	CTA10Q15C	TCO-15		5TCC-Q15	
C29	6		250088-137				2D12		GRM-2022	5TM-P22
C30	470		250218-15							
C31	1									
C32	6		250088-137				2D12		GRM-2022	5TM-P22
C33	10		250088-142	MT50-S1 10	TCN-10	CTA10Q1U	TCT-10	MT-541	5TCU-Q1	
C34	1500		250175-10	BPD-0015	DD-152	BYA10D47	ED-0016	DC5216	SGA-D16	
C35	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C36	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C37	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C38	100		250178-24	BPD-0001	DD-101	L10T1	ED-100	UC-531	SGA-T1	
C39	62	500	250218-325	MD5-0062	TCZ-62	2BH5Q62	TCO-62		MS-462	
C40	470		250178-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C41	680		250218-4	DI-00068	DD-681	L10T68	ED-680	UC-5368	SGA-T68	
C42	.22	200	250207-15	PT1HR-22		BR2P22		MC5322	5TM-P22	
C43	5000		250175-30	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C44	5000		250175-68	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C45	800		250218-14	BPD-0008	DD-801	L10T8	ED-0008	UC-5375	5GA-T8	
C46	800		250218-4	BPD-00068	DD-801	L10T68	ED-680	UC-5368	SGA-T68	
C47	800		250218-14	BPD-0008	DD-801	L10T8	ED-0008	UC-5375	SGA-T8	
C48	800		250218-14	BPD-0008	DD-801	L10T8	ED-0008	UC-5375	SGA-T8	
C49	1000		250175-7	BPD-001	DD-102	BYA10D5	ED-005	DC525	5HK-D5	
C50	30000		250175-7	BPD-02	DD-303	BYB652	ED-02	GRM-412	5HK-S2	
C51	5000		250218-13			BYA10D5		MC1644	MS-25	
C52	47	500	250226-423	5147	DS-470	5W5Q47	GP-47	UC-5447	5GA-Q47	
C53	.47	200	250302-17	PT2HR-47		CUBB2F47		GRM-3047	5TM-P47	
C54	100	500	250218-530	5100	D6-101	L10T1	GP-100	MC350	5FM-31	
C55	1000	2500	250178-27	BYD-30-1000	DD350-102	BYB650X	ED3-1000	DC3021	20GA-D1	
C56	.0033	600	250302-4	PT2HR-33		CUBB3D33		GRM-4033	5TM-D33	
C57	4.7		250221-123	NP0-S14.7	TC2-47U	C10V47C	TCC0-4.7	2T-5547	5TCCB-V47	
C58	56		250218-23	MT5D-D256	TCN-56	C10Q56U	TCT-56			
C59	68		250218-7	MT5D-D168	TCN-68	C10Q68U	TCT-68		5TCU-Q68	
C60	3900		250175-31	BPD-004	DD-402	BYA10D4	ED-004	UC-5240	SGA-D39	
C61	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C62	33		250207-42	5123	D6-330	L10Q33	GP-33	UC-5423	5GA-Q33	
C63	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C64	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C65	100		250207-46	81 100	D6-101	L10T1	GP-100	UC-531	SGA-T1	
C66	488		250218-15	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	Note 3

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C67	10000		250175-6	BPD-01	DD-103	BYA6S1	ED-01	DC51	5HK-S1	
C68	5000		250175-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C69	5000		250175-30	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	Note 4
C70	10000		250175-6	BPD-01	DD-103	BYA6S1	ED-01	DC51	5HK-S1	
C71	470	5	250218-15	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C72	.0047	600	250201-15	BPD-0047	D6-472	CUBD4F	GP-4700	GRM-6247	5TM-D47	
C73	.02	400	250321-1	BPD-0023	D6-233	CUBD3D	GP-2300	GRM-6223	5TM-D23	
C74	180		250329-554	SI 180	D6-181	SWST15	GP-180	MC336	1FM-S15	
C75	.1	400	250321-12	P416N-1	DF-104	CUB4F1		GRM-401	4TM-F1	
C76	5000		250218-13	1464-0068		BYA10D5		MC3468	MS-25	
C77	1000		250218-6	1454-001		BYA6D1	ED-1000	MC3565	MS-31	
C78	3700	500	250180-1048	1464-0037		1R3D37			MS-327	
C79	.047	400	250212-7	BPD-05	DF-503	CUB4S47		GRM-4147	4TM-S47	
C80	.1	400	250211-13	P416N-1	DF-104	CUB4F1		GRM-401	4TM-F1	
C81	1000		250218-6	1454-001		BYA6D1	ED-1000	MC3565	MS-31	
C82	1000		250218-6	1454-001		BYA5D1	ED-1000	MC3568	MS-31	
C83	.0047	400	250212-5	1464-0047		1R5D47			MS-347	
C84	.047	200	250212-5	BPD-05	DF-503	CUB2S47		GRM-2147	2TM-S47	
C85	500	500	250219-343	1464-00038		1R5T36			MA-338	
C86	3900	500	250219-468	1464-0039		1R5D39			MS-239	
C87	1000		250218-6	1454-001		1R5D1	ED-1000	MC3565	MS-31	
C88	470	500	250219-346	1464-00047	D6-471	1R5T47	ED-470		MA-347	
C89			250218-5	1454-001		1R5D1	ED-1000	MC3565	MS-31	
C90	.047	400	250212-5	BPD-05	DF-503	CUB4S47		GRM-4147	4TM-S47	
C91	.1	600	250201-13	P616N-1	DF-104	CUB6F1		GRM-601	6TM-F1	
C92	.047	400	250211-11	BPD-05	DF-503	CUB4S47		GRM-4147	4TM-S47	
C93	68	4000	250175-23	BVD-80-68						
C94	.1	400	250211-13	P416N-1	DF-104	CUB4F1		GRM-401	4TM-F1	
C95A	.0020	1000	250218-3	P1018N-01		DD18-103	CUB1S02	GRM-1021	1TM-S1	
B	10000	1000		P1018N-01		DD18-103	CUB1S02	GRM-1021	1TM-S1	

Note 2: Includes gimmick.
Note 3: 100MMF (#250207-46) used in chassis CTA/CMUA48TCC, 480CC, 48HCC, 499CC; 150MMF (#250207-47) used in chassis CTA/CMUA 50LBB; 1200MMF (#250218-6) used in chassis CTC/CMUE 493AA, BB, 494AA, BB, CTD/CMUD496AA, BBnot used in chassis CTA/CMUA50CC.
Note 4: Chassis CTA/CMUA ending in CC use .01MFD (#250175-53).
Note 5: Chassis CTA/CMUA50LBB, CC use .0015MFD @ 600V (#250201-2); not used in chassis CTD/CMUD, CTE/CMUE ending in BB.

CONTROLS

ITEM No.	RATING: RESIST ANCE	WATTS	REPLACEMENT DATA: MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	230126-46	A1-1Meg-2	Q13-137	U53		Volume (Note 1)
B	Shaft			A1-3	Not Req.	Not Req.		
C	Switch			SWE-12	78-1	U3-28		
R2A	500K	½	230135-4	A1-500K-2	Q13-153	TA55A		Tone
B	Shaft			A1-3	Not Req.	Not Req.		
R3A	2.5Meg	½	230138-3	EA-2M5	Q41-134	TA155L		Vertical Hold
B	Shaft			Not Req.	FK2-1/4	Not Req.		
R4A	250K	1	230132-3	EK-46	A47-250K-6	Q41-132		Brightness
B	Shaft			Not Req.	FK2-1/4	Not Req.		
R5A	50K	½	230132-1	EK-31	A47-50K-6	Q41-152	TA54L	Horiz. Hold
B	Shaft			Not Req.	FK2-1/4	Not Req.		
R6A	10K	½	230131-5				U56	Contrast - Tap ③ 8000Ω
B	Shaft						Not Req.	
R7A	2.5Meg	½	230138-4	EK-43	A47-2.5Meg-6	Q41-339	TA155L	Vertical Height
B	Shaft			Not Req.	FK2-1	Not Req.	Not Req.	
R8	3000Ω	2	230130-3		39-3000		FL-6K	Vertical Linearity

Note 1: 1Meg control & switch part #230135-1 used in chassis CTA/CMUA 496BB, 497BB.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: MAGNAVOX PART No.	IRC PART No.	NOTES
R9	100K		230104-86	BTS-100K	
R10	22K		230104-78	BTS-22K	
R11	330Ω	1	230104-45	BTA-330	
R12	100K		230104-86	BTS-100K	
R13	470K		230104-94	BTS-470K	
R14	470K		230104-94	BTS-470K	
R15	680Ω		230104-40	BTS-680	
R16	820Ω		230104-72	BTS-820	
R17	33K		230104-80	BTS-33K	
R18	330Ω		230104-32	BTS-330Ω	
R19	330Ω		230104-32	BTS-330Ω	
R20	680Ω		230104-40	BTS-680	
R21	680K		230104-91	BTS-680K	
R22	100K		230104-86	BTS-100K	
R23	10K		230104-74	BTS-10K	
R24	150Ω		230104-53	BTS-150	
R25	4700Ω	1	230104-60	BTA-4700	Note 1
R26	18K	2	230106-78	BTS-18K	
R27	100Ω	2	230104-50	BTS-100	
R28	18K	2	230106-78	BTS-18K	
R29	5600Ω		230104-52	BTS-5600	Note 1
R30	470K		230104-94	BTS-470K	
R31	8.1Meg	½	230094-354	BTA-8.1Meg ½	
R32	330K	½	230094-319	BTA-330K ½	
R33	180K	½	230094-312	BTA-180K ½	
R34	56K	½	230094-301	BTA-56K ½	
R35	3600Ω	½	230094-323		
R36	1000Ω		230104-52	BTS-1000	
R37	470		230104-46	BTS-47	
R38	100Ω		230104-50	BTS-100	
R39	22K	½	230104-78	BTS-22K	
R40	100Ω		230104-50	BTS-100	
R41	47Ω		230104-46	BTS-47	
R42	4.7K	½	230094-299		
R43	100Ω		230104-52	BTS-1000	
R44	120Ω		230104-51	BTS-120	
R45	470Ω			BTS-470	
R46	1200Ω	½	230094-161	BTA-1200 ½	
R47	3700Ω	½	230094-159	BTA-3700 ½	
R48	470K		230104-94	BTS-470K	
R49	22000	½	230095-167	BTA-2200 ½	
R50	4700Ω	½	230093-175	BTA-4700 ½	
R51	12K		230104-76	BTS-12K	
R52	3.9Meg	½	230094-326	BTS-39 ½	
R53	1800Ω		230104-85	BTS-1800	
R54	470K		230104-94	BTS-470K	Note 2

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: MAGNAVOX PART No.	IRC PART No.	NOTES
R55	33K		230104-80	BTS-33K	
R56	100K ½		230094-307	BTS-100K ½	
R57	560Ω	2	230106-71	BTA-560	
R58	1000Ω		230104-52	BTS-1000	
R59	33Ω		230104-49	BTS-33	
R60	270K		230104-91	BTS-270K	
R61	22K		230104-78	BTS-22K	
R62	47K		230104-82	BTS-47K	
R63	1000Ω		230104-52	BTS-1000	
R64	100K		230104-86	BTS-100K	
R65	100K		230104-86	BTS-100K	
R66	470K		230104-64	BTS-470K	
R67	4.7Meg		230104-308	BTS-4.7Meg	
R68	470K		230104-94	BTS-470K	
R69	15K		230104-75	BTS-15K	
R70	1Meg		230104-98	BTS-1Meg	
R71	1.2Meg ½		230104-147	BTS-1.2Meg ½	
R72	1Meg ½	1	230094-331	BTS-1Meg ½	
R73	3300Ω	2	230105-83	BTA-3300	
R74	270Ω	3	230106-55	BTS-270	
R75	4700Ω		230104-60	BTS-4700	
R76	470K		230104-94	BTS-470K	
R77	1.2Meg		230104-147	BTS-1.2Meg	
R78	1Meg		230104-98	BTS-1Meg	
R79	1Meg		230104-98	BTS-1Meg	
R80	22K		230104-78	BTS-22K	
R81	33000 ½		230094-171	BTS-3300 ½	
R82	270Ω		230104-55	BTS-270	
R83	30000 ½		230094-170	BTS-3000 ½	
R84	47K		230104-82	BTS-47K	
R85	1Meg		230104-98	BTS-1Meg	
R86	270K	1	230105-91	BTA-270K	
R87	1.6Meg ½		230094-316	BTS-1.6Meg ½	
R88	15K ½		230094-188	BTS-15K ½	
R89	1.5Meg	1	230105-91	BTA-1.5Meg	
R90	1.5Meg		230104-100	BTS-1.5Meg	
R91			230130-1		Note 3
R92	1000Ω		230104-52	BTS-1000	
R93	270Ω ½		230094-146	BTS-270 ½	Note 4
R94	2700 ½		230094-145	BTS-270 ½	Note 4
R95	100K		230104-86	BTS-100K	
R96	100K		230104-86	BTS-100K	
R97	470K		230104-94		
R98	4.7Meg		230104-106	BTS-4.7Meg	
R99	68000 ½		230094-179		

RESISTORS (cont)

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: MAGNAVOX PART No.	IRC PART No.	NOTES
R100	1500Ω ½	3	230094-183		
R101	100K ½		230094-307		
R102	150K ½		230094-311		
R103	12K		230104-76		
R104	470K		230104-94		
R105	10K	5	230071-4	PW10-10K	
R106	1500Ω	1	230105-84	BTA-1500	
R107	270K		230104-91	BTS-270K	
R108	180	3	230106-41		
R109	15K	1	230105-76		
R110	5900Ω		230104-72		
R111	5.9Ω		230105-3		
R112	1200Ω	1	230105-65	BTA-1200	
R113	680Ω		230104-40	BTS-680	
R114	120K		230102-1	BTS-120K	

Note 1: Not used in some versions.
Note 2: A 220K resistor (#230104-90) used in chassis ending in CC.
Note 3: Special temp. compensation resistor approximately 980K.
Note 4: A 2300Ω ½ resistor (part #230094-143) used in chassis ending in BB or CC.

TRANSFORMER (POWER)

ITEM No.	RATING	REPLACEMENT DATA: MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC 275VCT @ 1.5A @ 330A @ 5A	6.3V @ 6.5A	MX300077-1	P9788 ①	P-8578 ①	P-8288 ①	R-32DC ①

① Fabricate mounting.
② Use original mtg. bracket.
③ Parallel & phase 6.3V filament windings.
④ Parallel & phase 5.3V, 5A windings.
⑤ Tape low high voltage winding; tape 5V, 2A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T3	Horiz. Output Trans.	260823					A-8295*	FLY-7P*	
T3	Vert. Output Trans.	260823-1 ① 260253-2 ② 260255-1 ③					A-103		
T4A	Yoke(90°)Horiz(15.3MH)	260161-1 ②	DF90T ②	MDF-92 ②	225DI ③	T90F15/42 ③	DY-16A ②	Y-16 ②	Y-41-1 ②
B	Vert(45MH)	260162-1 ③							
T5A	Width-Series Coil								
	1 & 2-3.3MH			MWC-10				WC-24	
B	Parallel Coil (4.2-32MH)								

① Alternate part number.
② Does not matter leads or rear cover.
③ Takes rear cover.
④ Use original yoke damping network.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL (CONNECTIONS)	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8					8	8	
	5					5	6	
	3					3	3	
	4					4	2	
	2					2	9	
	1					1	1	
Connect Width Coil Across	2 & 1					2 & 1	2 & 1	
Special Note							③	

③ If insufficient width, add capacity (50-100MMF @ 4KV (MINIMUM)) across horiz. yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI	SEC.	REPLACEMENT DATA: MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T6	3400Ω	3-4Ω	320068-2	21U05 ①	A-3018	A-3849	22S65 ①	S-6X ①	① Drill one new mtg. hole.

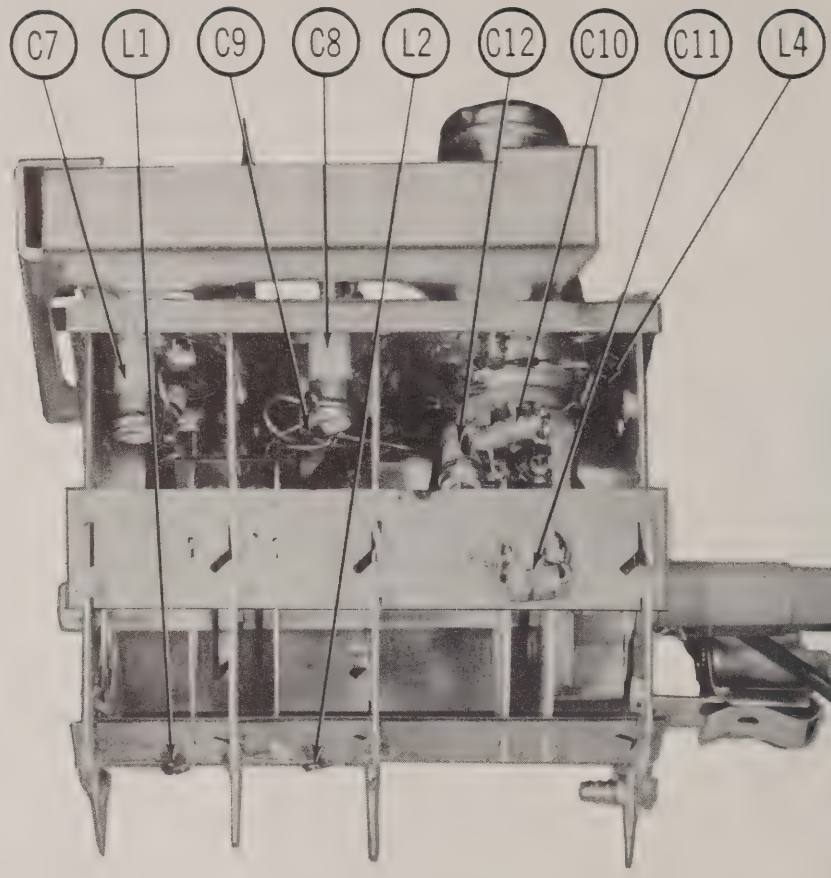
COILS (RF-IF)

ITEM No.	USE	MAGNAVOX PART No.	NOTES
L1	RF Choke	360574-30	
L2	RF Choke	360574-30	
L3	Cathode Choke	360532-7	
L4	FIL Choke	360574-8	
L5	FIL Choke	360574-8	
L6	RF Choke	360574-8	
L7	UHF IF Coupling Coil	360574-12	
L8	RF Choke	360574-60	

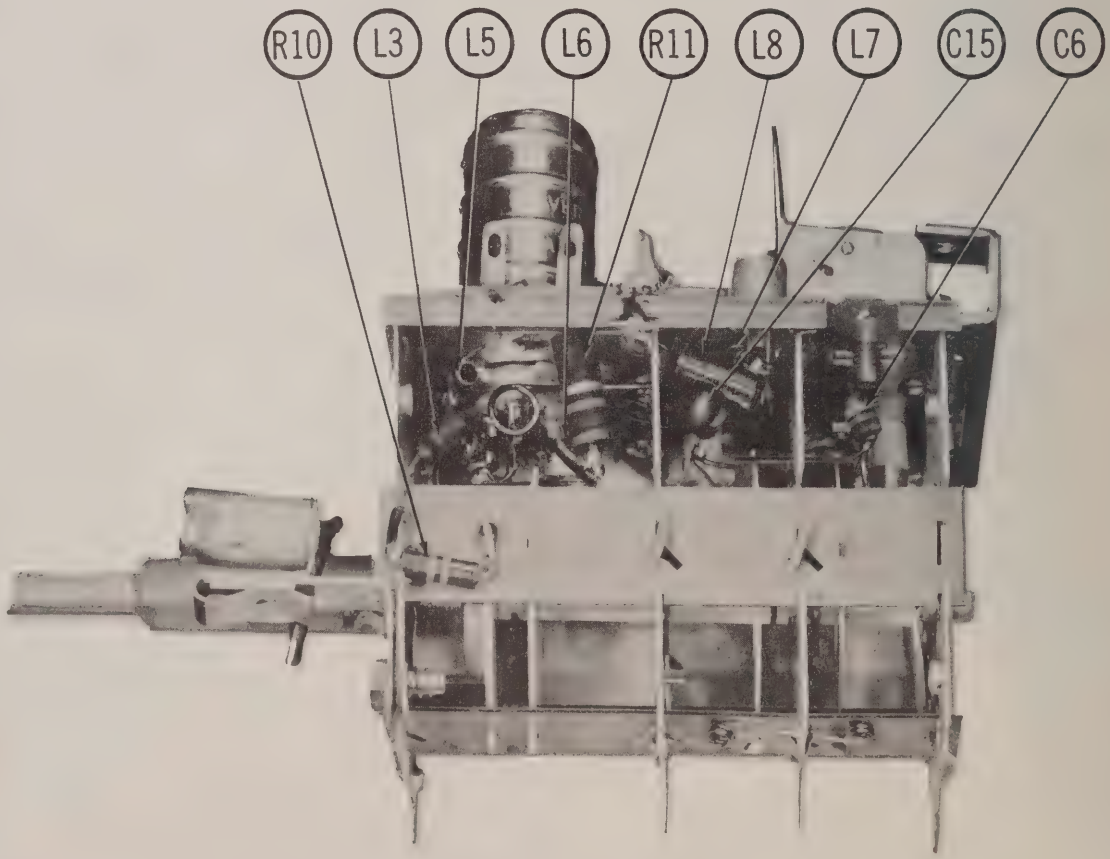
ITEM No.	USE	MAGNAVOX PART No.	NOTES
L9	VHF Ant. Trans.	360491-2	
L10	IF Trap	360801-8	
L11	UHF IF Input Coil	360549-1	
L13	RF Choke	360491-3	
L13	Mixer Plate	360540-1	
L14	RF Choke	360574-8	
L15	IF Trap	360520-1	
L16	IF Trap	360520-1	

TRANSFORMERS (SWEEP CIRCUITS)

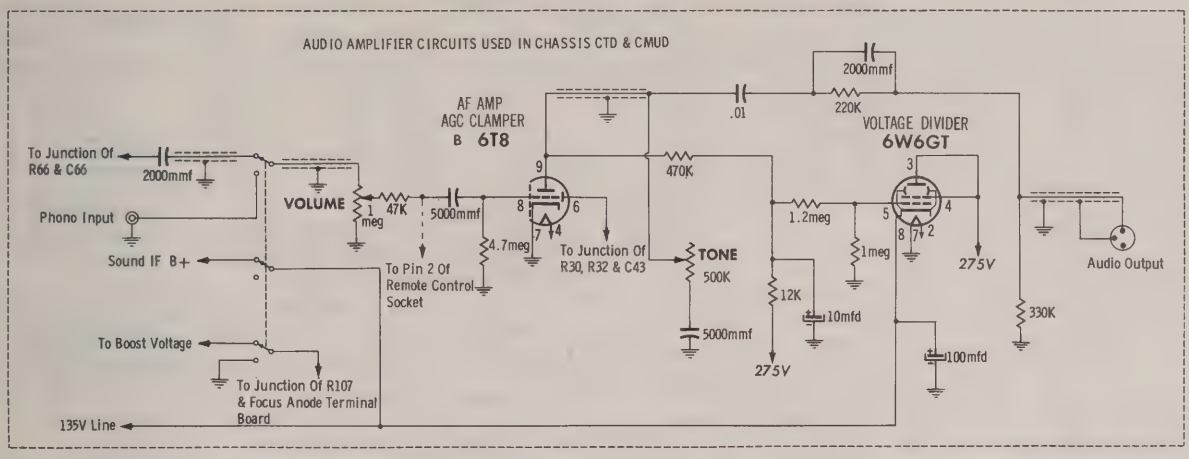
ITEM No.	USE	MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L17	1st Video IF	360545-1	17-4603			Includes 41.25MC trap.
L18	2nd Video IF	360544-1	17-4531			Includes 47.25MC trap.
L19	3rd Video IF	360544-2	17-5003*	TY-138*	6323*	Includes 45.75MC trap.
L20	Series Peaking Coil	360532-14	19-3976*		6178*	76 Microhenries; Wound on 10K resistor.
L21	Shunt Peaking Coil	360823-7	19-6400		6136	220 Microhenries
L22	FIL Choke		19-1000		6803	1 Microhenry
L23	Shunt Peaking Coil	360823-4	19-3500		6138	150 Microhenries
L24	Shunt Peaking Coil	360823-7	19-6400		6136	220 Microhenries
L25	Series Peaking Coil	360823-13	19-3300*	TY-18A	6134	100 Microhenries; Wound on 10K resistor.
L26	4.5MC Trap	360564-1	30-3004	TY-1H	1468	

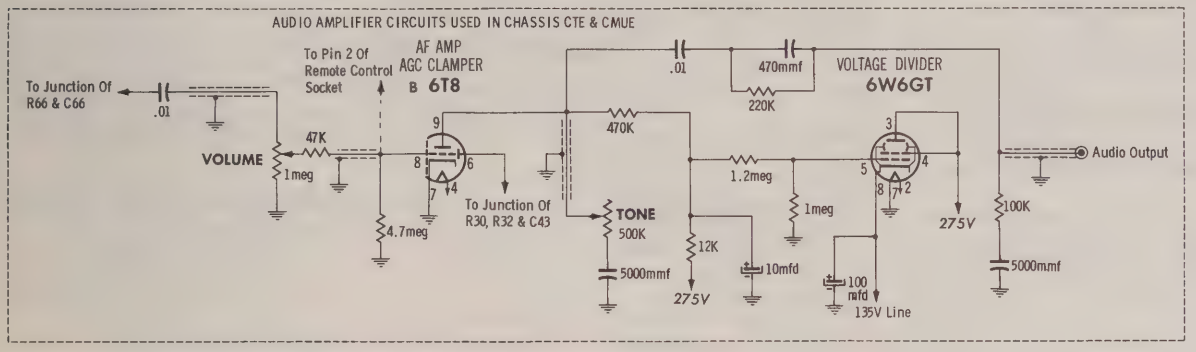


UHF TUNER-LEFT SIDE



UHF TUNER-RIGHT SIDE





A PHOTOFACT STANDARD NOTATION SCHEMATIC

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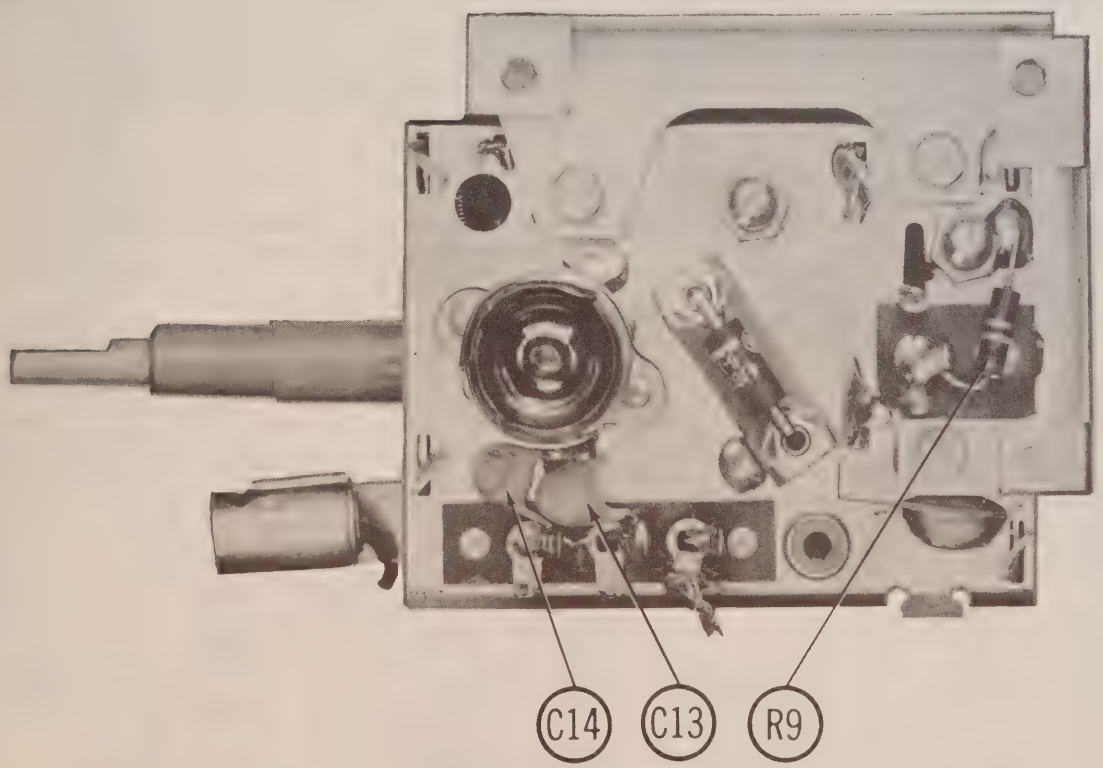
ALTERNATE AUDIO AMPLIFIER CIRCUITS



UHF TUNER TOP VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L27	1st Sound IF	360584-1	20-1004	TV-151	1469	
L28	2nd Sound IF	360584-1	20-1004	TV-151	1469	
L29	Discriminator	360642-1	17-3496	TV-114	6204	

* Use adaptor plate.
■ Parallel with 8200Ω resistor.
▲ Parallel with 10K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L30	65Ω		360579-1							

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L31	.230A	36. 5Ω	.6HY	320058-2B	C5037 ①		C2326 ①	26C41	C-17X ①

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MAGNAVOX PART No.	REPLACEMENT DATA	
K1	Vertical Integrator	22K, 8200Ω, 8200Ω, 2000MMF, 5000MMF, 5000MMF	250186-1	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-110 PC-100 115TM1 1405-01 V-1

FUSES

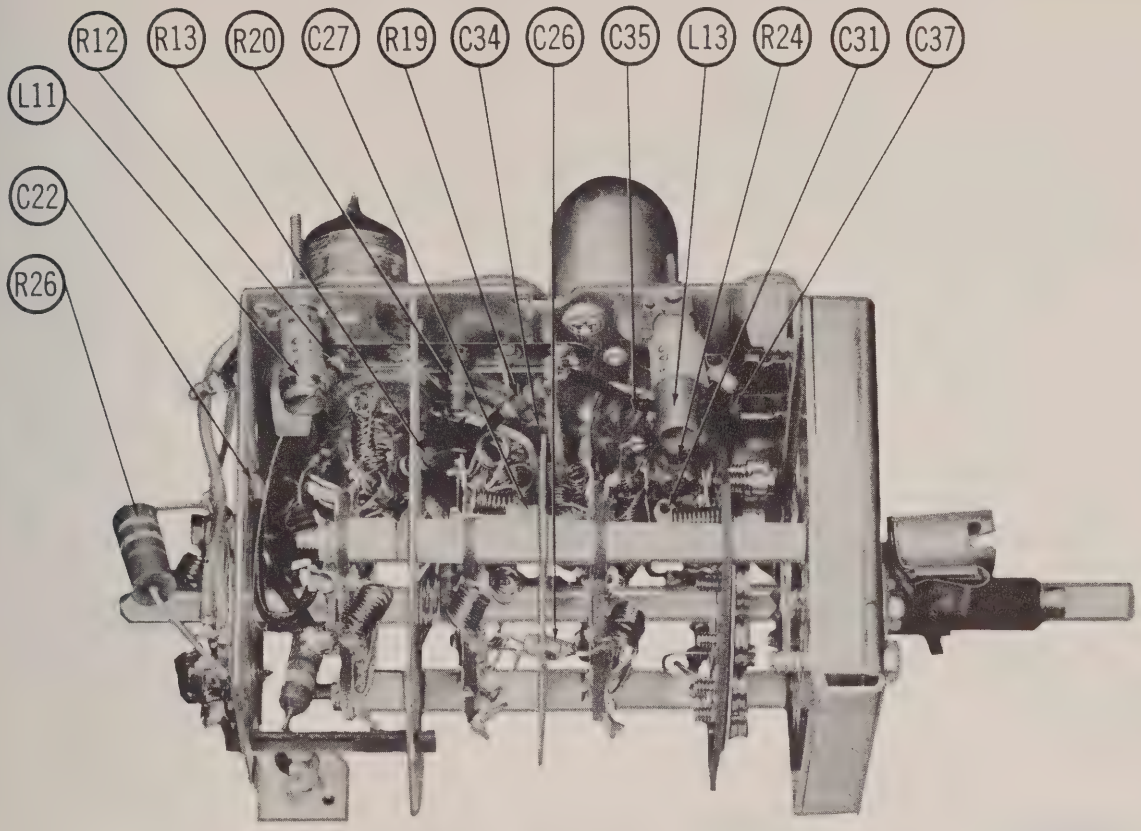
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MAGNAVOX PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	1/4A 250V	180157-30		313. 250 (3AG-S/B-1/4A)	357001	MDL 1/4	4405

CRYSTAL DIODES

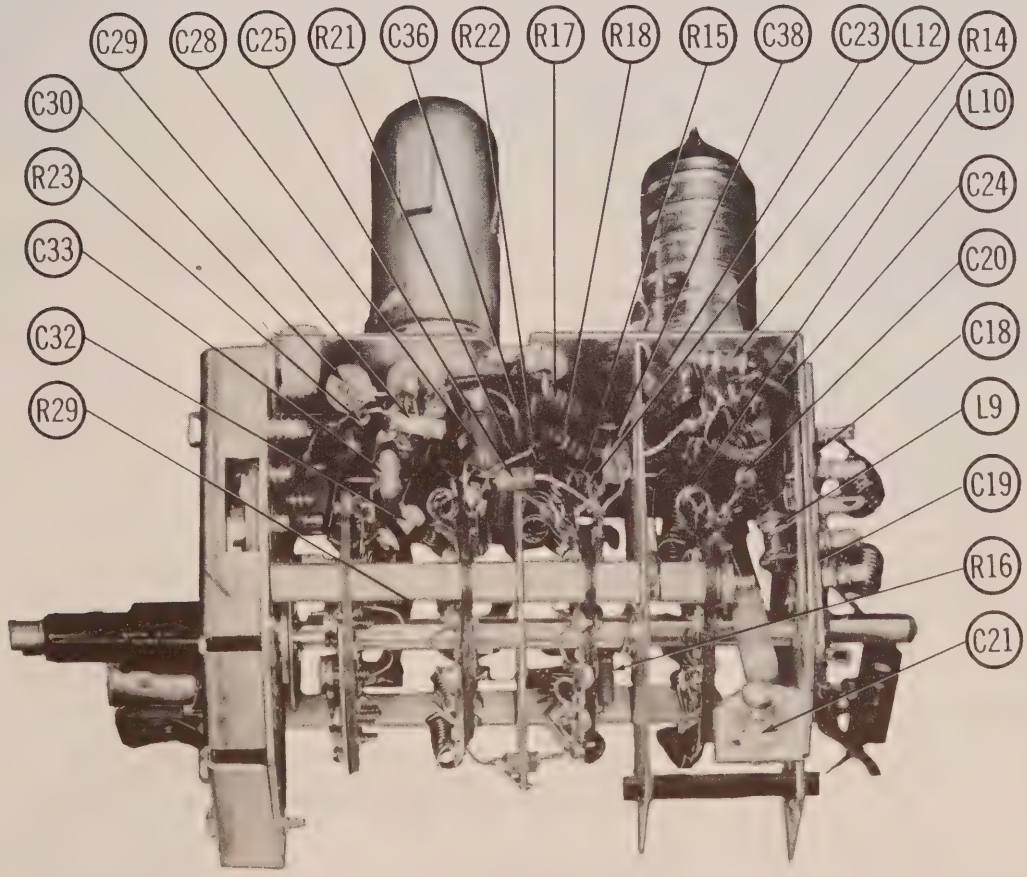
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		MAGNAVOX PART No.	SYLVANIA PART No.	
M2	1N64	530036-1	1N82A	UHF Mixer (Clip In)
M3			1N60	Video Det. (Pigtail)

MISCELLANEOUS

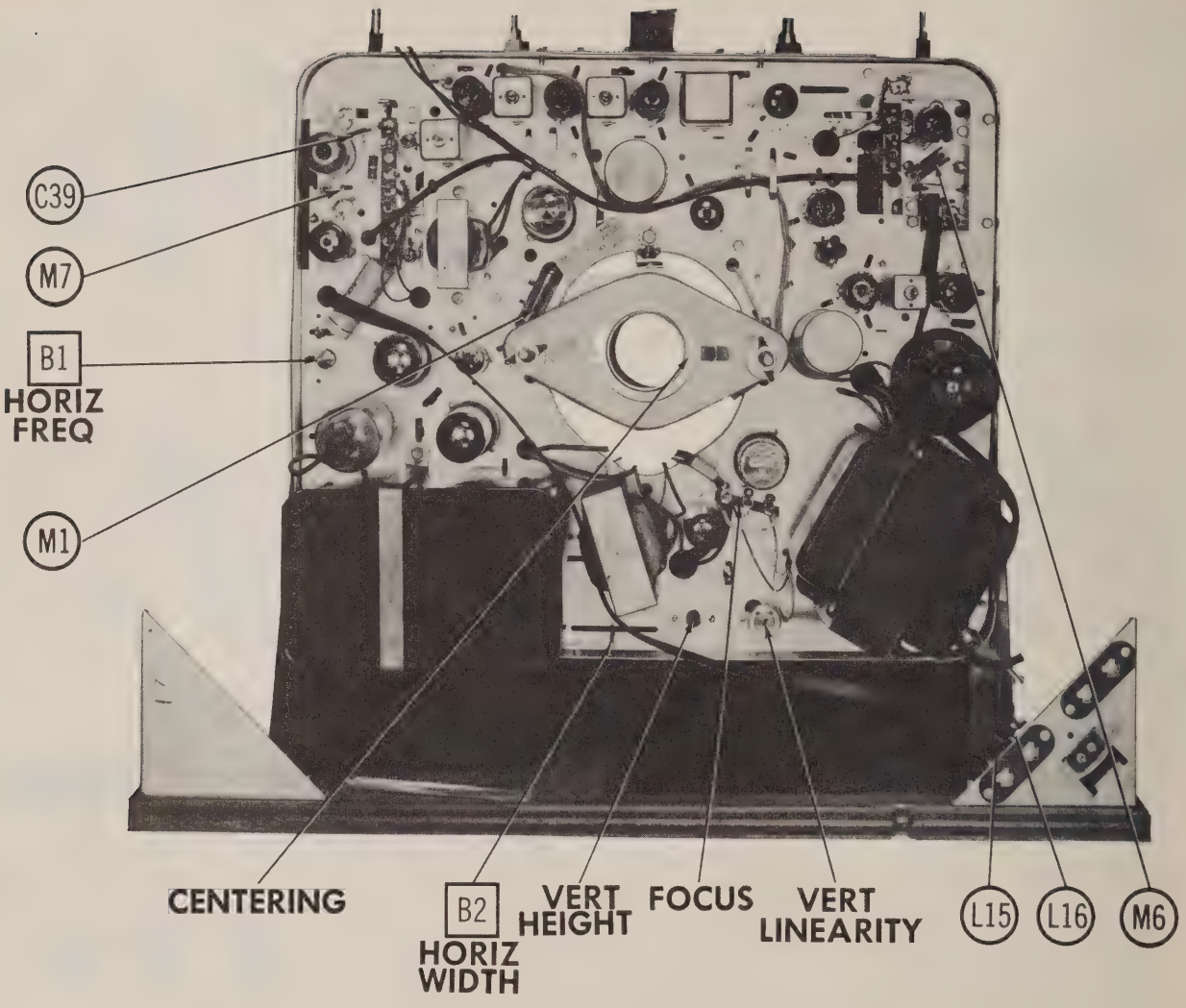
ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M4	Dial Lamp		UHF Tuner
M5	Dial Lamp		VHF Tuner
M6	Tuner	700530-2	UHF
M7	Tuner	700541-1	VHF
M8	Video Det. Ass'y.	360643-1	Includes 4th Video IF, 470Ω resistor, 10MMF Cap, Series Peaking Coil and M3.
M9	Switch	160247-1	UHF/VHF (Wafer-Rotary Type)
M10	Centering Device		
M11	Ion Trap	360492-5	Alternate part #360492-7 used in chassis CTA/CMUA491BB, CC, 497BB, CTD/CMUD495BB, CC, CTE/CMUE494BB.
	Switch	160232-1	Phono - Used in chassis CTD/CMUD.
	Switch	160251-1	AC Interlock (Top Mounted). Used in some versions ending in AA.
	Switch	160253-2	AC Interlock (Side Mounted). Used in some versions ending in AA.



VHF TUNER-LEFT SIDE



VHF TUNER-RIGHT SIDE



REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the horizontal hold control to its mid-range position.

Turn the horizontal frequency slug (B1) slowly clockwise while switching off and on channel until the picture loses sync.

Turn B1 slowly counter clockwise until the picture regains sync, then continue 1/2 turn in the same direction.

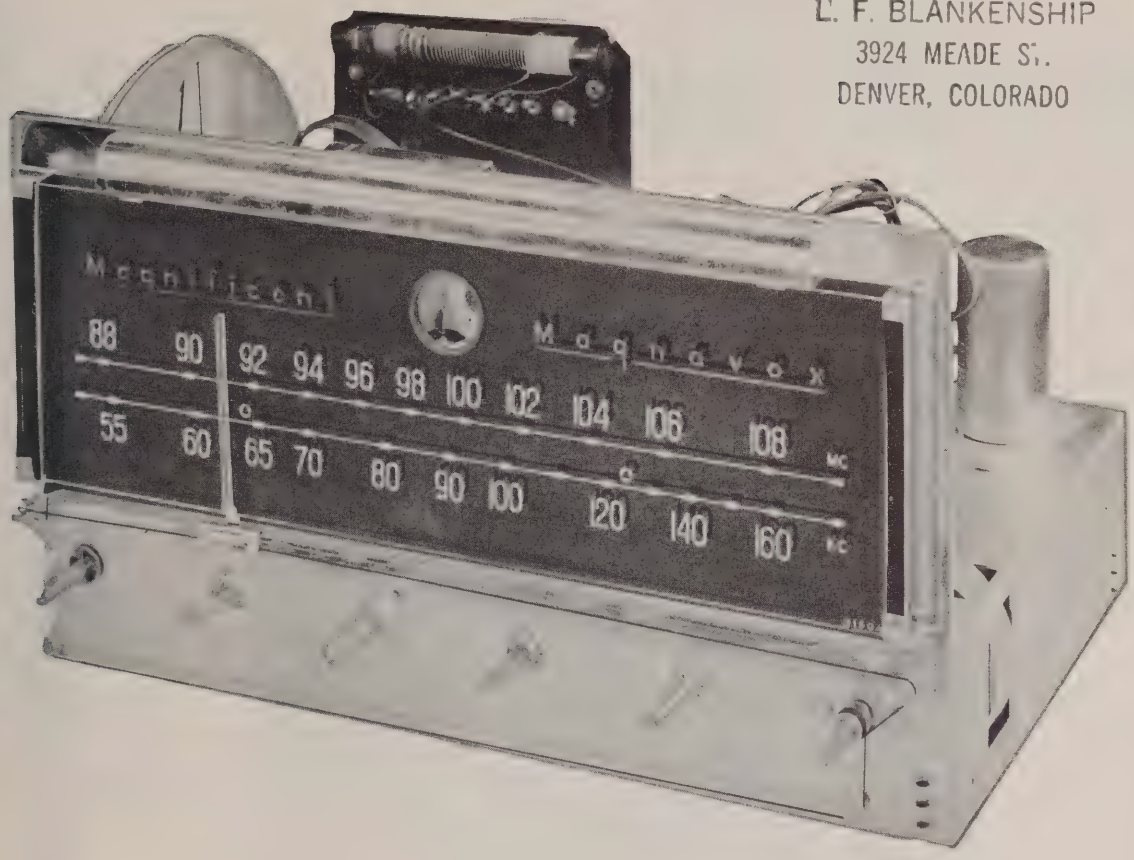
The picture should hold sync at both extreme settings of the horizontal hold control.

If necessary, readjust B1 slightly and test for sync or pull in as above.

Adjust the width slug (B2) for a picture slightly wider than necesssary to fill the picture horizontally.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

MAGNAVOX
CHASSIS CR730AA



MAGNAVOX
CHASSIS CR730AA

TRADE NAME	Magnavox Chassis CR730AA
MANUFACTURER	Magnavox Co., 2131 Bueter Rd., Fort Wayne, Ind.
TYPE SET	Externally Powered FM-AM Tuner
TUBES (Nine)	Types 6BZ6 RF Amplifier, 6U8 FM Mixer-Osc., 6BE6 AM Converter, 6BA6 1st. IF Amplifier, 6BA6 2nd. FM IF Amplifier, 6AL5 Ratio Detector, 6AV6 Phono Preamp., 12AT7 AF Amp.-Cath. Follower, 6E5 Tuning Ind.
TUNING RANGE-BROADCAST	540KC-1620KC FREQ. MOD. 88MC-108MC

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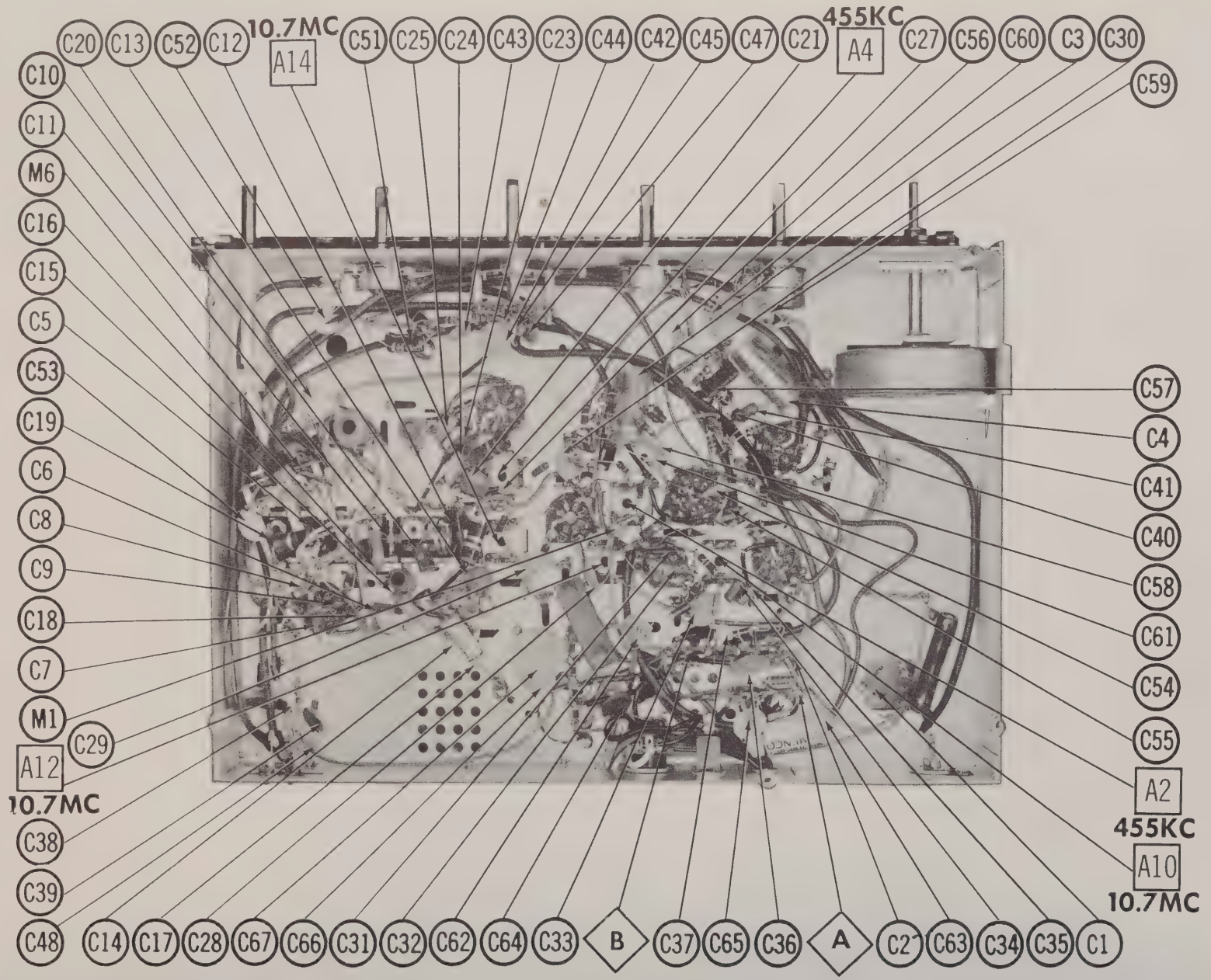
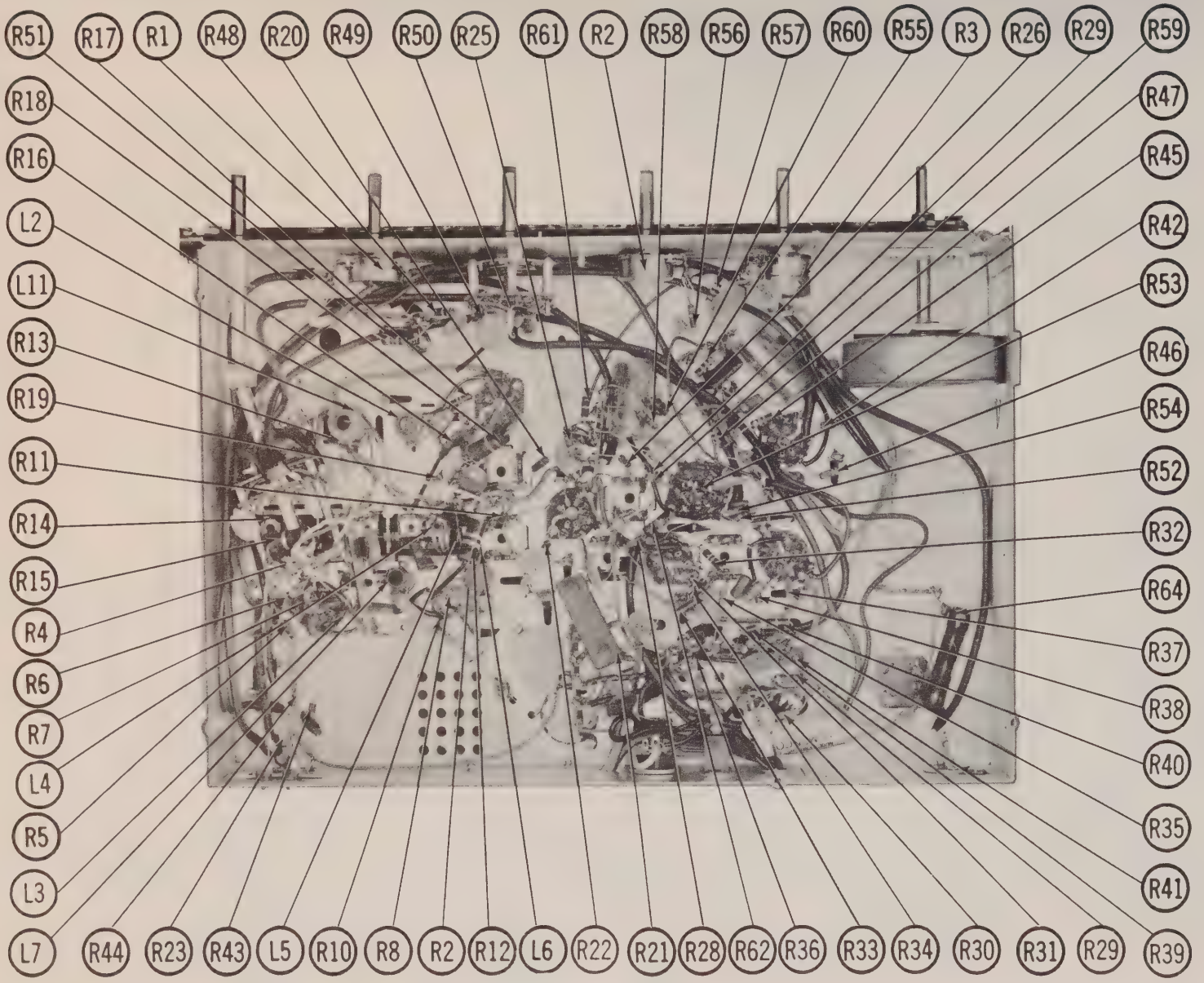


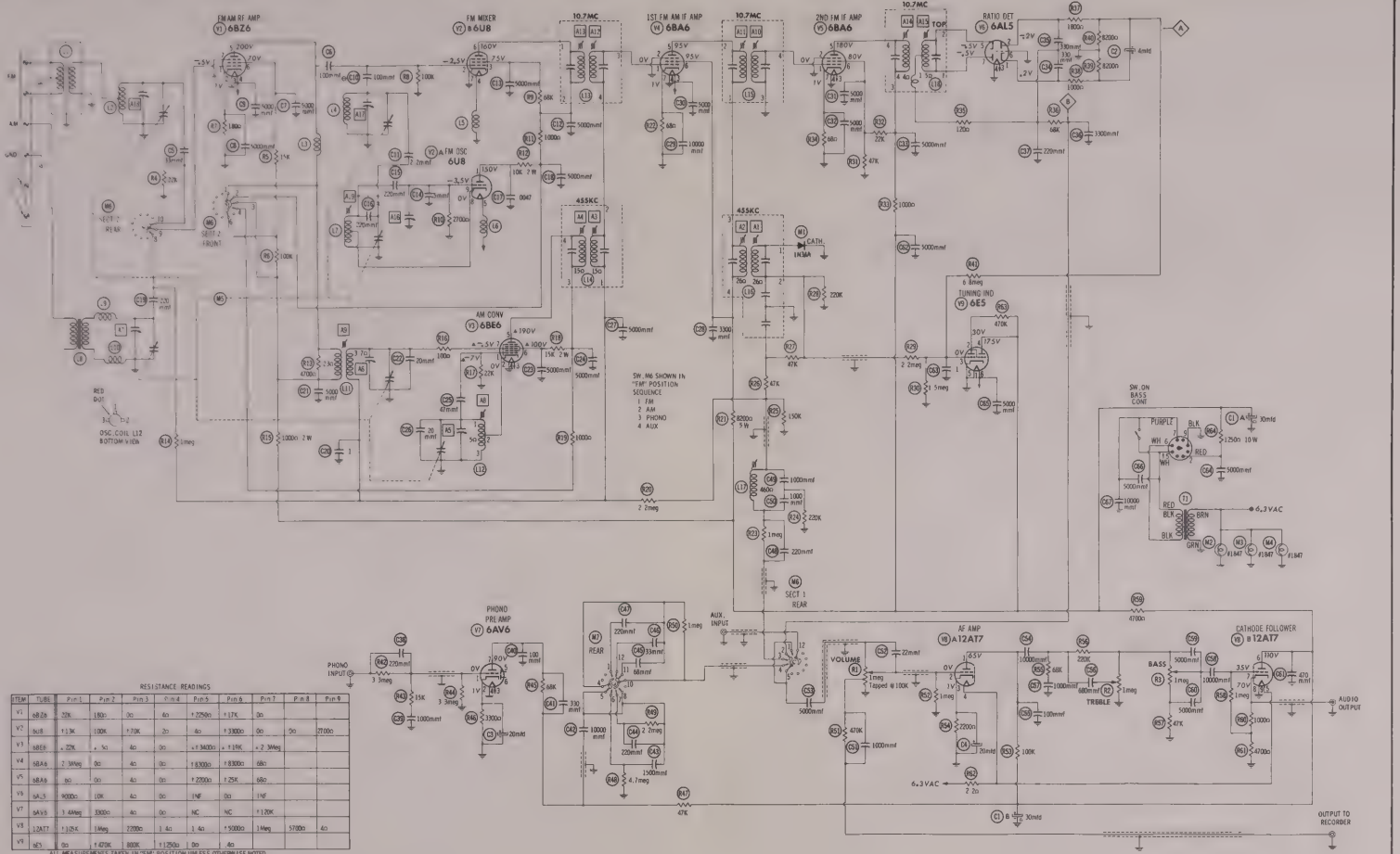
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

MAGNAVOX
CHASSIS CR730AA



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	22K	180Ω	0Ω	4Ω	*2250Ω	↑17K	0Ω		
V2	6U8	↑3.3K	100K	*70K	2Ω	4Ω	↑33000	0Ω	0Ω	27000
V3	6BE6	▲ 22K	▲ 5Ω	4Ω	0Ω	▲↑34000	▲↑19K	▲ 2.3Meg		
V4	6BA6	2.3Meg	0Ω	4Ω	0Ω	↑83000	↑83000	68Ω		
V5	6BA6	0Ω	0Ω	4Ω	0Ω	*22000	↑25K	68Ω		
V6	6AL5	90000Ω	10K	4Ω	0Ω	INF	0Ω	INF		
V7	6AV6	3.4Meg	3300Ω	4Ω	0Ω	NC	NC	↑120K		
V8	12AT7	↑125K	1Meg	2200Ω	1.4Ω	1.4Ω	↑50000	1Meg	5700Ω	4Ω
V9	6E5	0Ω	↑470K	800K	↑1250Ω	0Ω	4Ω			

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE NOTED.
▲ MEASURED IN "AM" POSITION
↑ MEASURED FROM PIN 2 OF POWER PLUG.
NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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350-9

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.
Treble control to sharp tune position.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400%Mod)	AM	1000KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	10MMF	High side to AM antenna terminal. Low side to chassis.	1400KC	"	1400KC	"	A5, A6, A7	"
3.	"	"	600KC	"	600KC	"	A8, A9	Adjust for maximum output. Repeat steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 5 (plate) of 6BZ6 (V1). Low side to chassis.	10.7MC (Unmod)	FM	Low freq. end of dial.	DC probe thru 1Meg to point (A). Common to chassis.	A10, A11, A12, A13, A14	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (B). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat steps 4 and 5.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD & 1000Ω in series	High side to pin 5 (plate) of 6BZ6 (V1). Low side to chassis.	10.7MC (300KC Swp)	FM	Low freq. end of dial	Vert. Amp. thru 1meg to point (A). Low side to chassis.	A10, A11, A12, A13, A14	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. Amp. thru 100K to point (B). Low side to chassis.	A15	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines. Repeat steps 4 and 5.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	120Ω & 150Ω carbon resistors	High side thru 120Ω to FM antenna terminal. Low side thru 150Ω to chassis.	106MC	FM	106MC	DC probe thru 1Meg to point (A). Common to chassis.	A16, A17 A18	Adjust for maximum deflection.
7.	"	"	90MC	"	90MC	"	A19	Adjust for maximum deflection. Repeat steps 6 and 7.

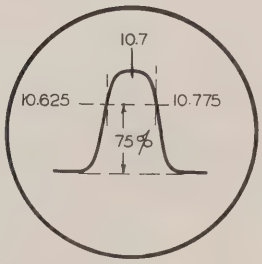


FIG. 1

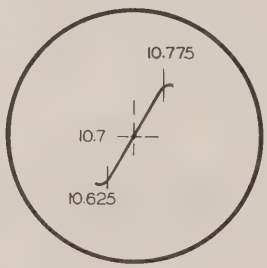


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BZ6	
V2	FM Mixer-Oscillator	6U8	
V3	AM Converter	6BE6	
V4	1st. IF Amplifier	6BA6	
V5	2nd. FM IF Amplifier	6BA6	
V6	Ratio Detector	6AL5	
V7	Phono Pre-amplifier	6AV6	
V8	AF Amp.-Cath. Follower	12AT7	
V9	Tuning Indicator	6E5	

ELECTROLYTIC CAPACITORS

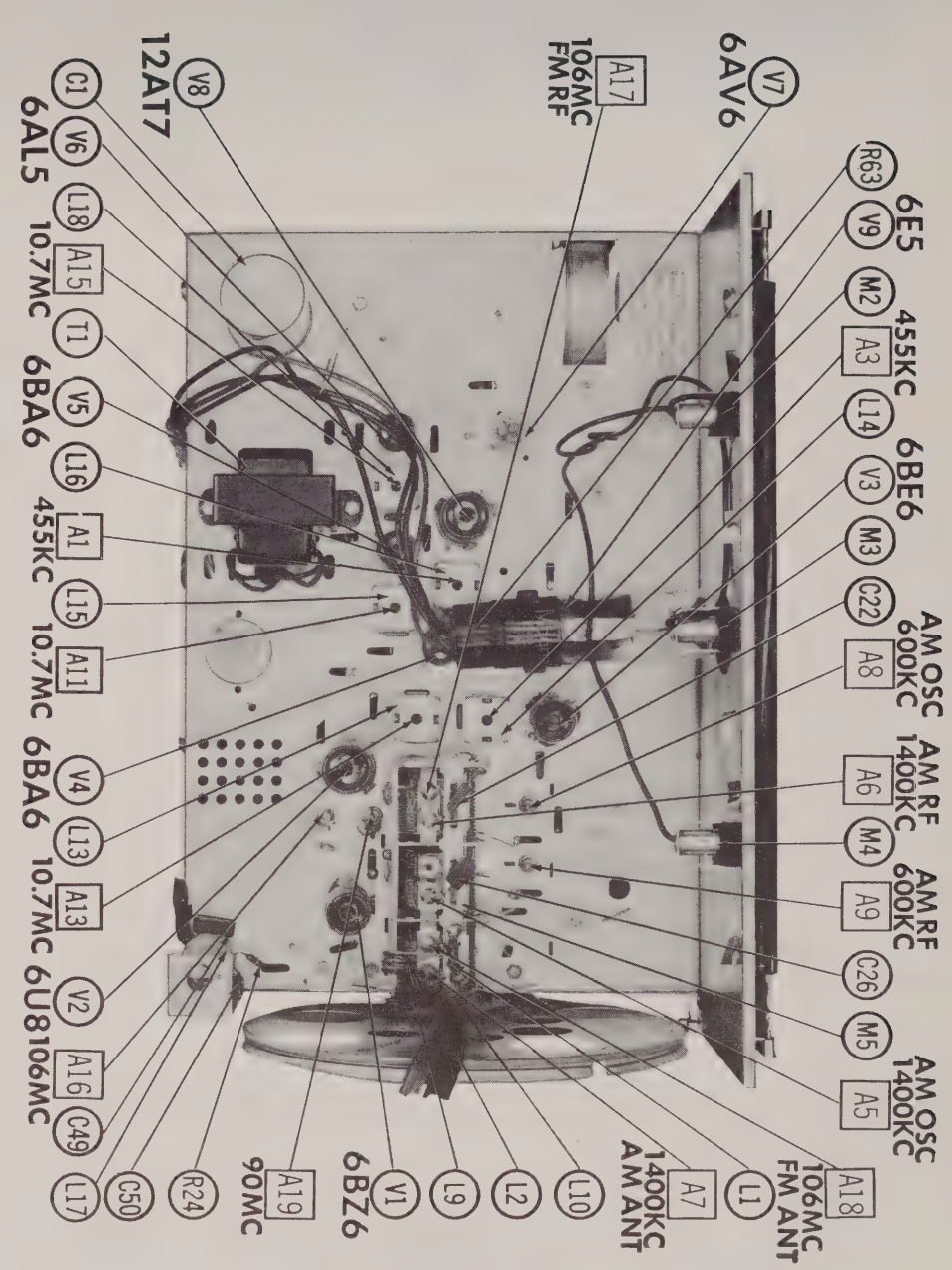
ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲30	450	270021-58	AFH2-54	BO430	FP237	TMD-52	D-225	TVL-2759
B	▲30	450							
C2	4	50	270027-27	PRS150V4	BBR4-50	TC30	TD-4-50	MMT-0505	TVA-1303
C3	20	25	270027-28	SRE25V20	BBR20-25	TC26	TD-25-25	FM-0225	TVA-1205
C4	20	25	270027-28	SRE25V20	BBR20-25	TC26	TD-25-25	FM-0225	TVA-1205

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	33	500	250187-47	1469-000033		5R5Q33			MS-433	
C6	100	500	250187-53	1469-0001		5R5T1		MCB235	MS-31	
C7	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C8	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C9	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C10	100	500		1469-0001		5R5T1		MCB235	MS-31	Note 1
C11	2.2		250221-118	NP0-SI2.2	TCZ-2R2	C10V22C	TCO-2.2		5TCCB-V22	
C12	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C13	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C14	5		250088-138							
C15	220	500	250159-55	BPD-00022	DD-221	5W5T22	ED-220	UC-5322	1FM-322	
C16	220	500	250159-55	BPD-00022	DD-221	5W5T22	ED-220	UC-5322	1FM-322	
C17	.0047	400	250211-5	BPD-0047	DD-472	CUB6D47		GEM-4247	6TM-D47	
C18	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C19	220	500	250186-57	1468-00022	DD-221	5W5T22	ED-220	UC-5322	1FM-322	
C20	.1	200	250202-13	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C21	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C22	20	500	250187-5	1469-00002		5R5Q2			MS-42	
C23	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C24	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C25	47	500	250187-49	1469-000047		5R5Q47			MS-447	
C26	20	500	250187-5	1469-00002		5R5Q2			MS-42	
C27	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C28	3300		250175-28	BPD-0033	D6-332	BYA10D33	GP-3300	UC-5233	5GA-D33	
C29	10000		250218-19	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C30	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C31	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C32	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C33	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C34	330		250207-49	BPD-00033	D6-331	L10T33	ED-330	UC-5333	5GA-T33	
C35	330		250207-49	BPD-00033	D6-331	L10T33	ED-330	UC-5333	5GA-T33	
C36	3300		250175-28	BPD-0033	D6-332	BYA10D33	GP-3300	UC-5233	5GA-D33	
C37	220		250218-5	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C38	220		250218-5	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C39	1000		250218-8	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C40	100		250218-22	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C41	330		250207-49	BPD-00033	D6-331	L10T33	ED-330	UC-5333	5GA-T33	
C42	10000		250218-19	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C43	1500		250218-18	BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15	
C44	220		250218-5	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C45	68		250218-7	N750-SI 68	TCN-68	C10Q68U	TC7-68		5TCU-Q68	
C46	33		250218-21	BPD-000033	DD-330	L10Q33	ED-33	UC-5433	5GA-Q33	
C47	220		250218-5	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C48	220		250218-5	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C49	1000	500	250228-354	1464-001		1DR5D1		MCE255	MS-21	
C50	1000	500	250228-354	1464-001		1DR5D1		MCE255	MS-21	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C51	1000	500	250228-354	1464-001		1DR5D1		MCE255	MS-21	
C52	22		250218-1	BPD-000022	DD-220	L10Q22	ED-22	UC-5422	5GA-Q22	
C53	5000		250175-30	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C54	10000		250218-19	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C55	100		250218-22	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C56	680		250218-4	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68	
C57	1000	500	250228-354	1464-001		1DR5D1		MCE255	MS-21	
C58	10000		250218-19	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C59	5000		250175-30	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C60	5000		250175-30	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C61	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C62	5000		250175-1	BPD-005	DD-502	BYA6D5	GP-5000	DC525	5HK-D5	
C63	.1	200	250202-13	P288N-1	DF-104	CUB2P1		GEM-401	2TM-P1	
C64	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C65	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C66	5000		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C67	10000		250218-19	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	

Note 1. Some versions may use 33MMF in this application (Part #250187-47).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	220074-12		A47F3-1Meg	QI8-137X		Volume-tap @ 100K
B	Shaft				FS-3	Not Req.		
R2A	1Meg	½	220072-29	B-70	A47-1Meg-Z	QI3-137	U53	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1Meg	½	220073-20	AB-70	A47-1Meg-Z	QI3-137	U53	Bass
B	Shaft			AK-3	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	MAGNAVOX PART No.	IRC PART No.	NOTES
R4	22K		230104-78	BTS-22K	
R5	15K		230104-76	BTS-15K	
R6	100K		230104-86	BTS-100K	
R7	180Ω		230104-53	BTS-180	
R8	100K		230104-86	BTS-100K	
R9	68K		230104-84	BTS-68K	
R10	2700Ω		230104-67	BTS-2700	
R11	1000Ω		230104-62	BTS-1000	
R12	10K	2	230096-74	BTB-10K	
R13	4700Ω		230104-70	BTS-4700	
R14	1Meg		230104-98	BTS-1Meg	
R15	1000Ω	2	230096-62	BTB-1000	
R16	100Ω		230104-50	BTS-100	
R17	22K		230104-78	BTS-22K	
R18	15K	2	230096-76	BTB-15K	
R19	1000Ω		230104-62	BTS-1000	
R20	2.2Meg		230104-102	BTS-2.2Meg	
R21	8200Ω	5	240071-13	PW10-8200	
R22	68Ω		230104-48	BTS-68	
R23	1Meg		230104-98	BTS-1Meg	
R24	220K		230104-90	BTS-220K	
R25	150K 5%		230104-88	BTS-150K 5%	
R26	47K		230104-82	BTS-47K	
R27	47K		230104-82	BTS-47K	
R28	220K		230104-90	BTS-220K	
R29	2.2Meg		230104-102	BTS-2.2Meg	
R30	1.5Meg		230104-100	BTS-1.5Meg	
R31	47K		230104-82	BTS-47K	
R32	22K		230104-78	BTS-22K	
R33	1000Ω		230104-62	BTS-1000	
R34	68Ω		230104-48	BTS-68	
R35	120Ω		230104-51	BTS-120	
R36	68K		230104-84	BTS-68K	
R37	1800Ω		230104-65	BTS-1800	
R38	1000Ω		230104-62	BTS-1000	
R39	8200Ω		230104-73	BTS-8200	
R40	8200Ω		230104-73	BTS-8200	
R41	6.8Meg		230104-108	BTS-6.8Meg	
R42	3.3Meg		230104-101	BTS-3.3Meg	
R43	15K		230104-76	BTS-15K	
R44	3.3Meg		230104-101	BTS-3.3Meg	
R45	68K		230104-84	BTS-68K	
R46	3300Ω		230104-68	BTS-3300	
R47	47K		230104-82	BTS-47K	
R48	4.7Meg		230104-106	BTS-4.7Meg	
R49	2.2Meg		230104-102	BTS-2.2Meg	
R50	1Meg		230104-98	BTS-1Meg	
R51	470K		230104-94	BTS-470K	
R52	1Meg		230104-98	BTS-1Meg	
R53	100K		230104-86	BTS-100K	
R54	2200Ω		230104-66	BTS-2200	
R55	68K		230104-84	BTS-68K	
R56	220K		230104-90	BTS-220K	
R57	47K		230104-82	BTS-47K	
R58	1Meg		230104-98	BTS-1Meg	
R59	4700Ω		230104-70	BTS-4700	
R60	1000Ω		230104-62	BTS-1000	
R61	4700Ω		230104-70	BTS-4700	
R62	2.2Ω		230109-2	BW½-2.2	
R63	470K		230104-94	BTS-470K	
R64	1250Ω	10	240021-45	PW10-1250	

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .28A	6.3VAC @ 3.2A			320258-2 ①	F5512 ②	P-2947 ②③	P-6466 ②③	21F10 ②③	F-18X ②③

① Alternate part #320258-1.
② Tape center tap on secondary winding.
③ Fabricate mounting.

COILS (RF-IF)

ITEM No.	USE	MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Trans.	360491-3				
L2	FM Ant. Coil	360656-1				
L3	RF Choke	360522-9	19-1002		4606	2 Microhenries
L4	FM RF Coil	360629-1				
L5	Fil. Choke	360522-9	19-1002		4606	2 Microhenries
L6	Fil. Choke	360522-9	19-1002		4606	2 Microhenries
L7	FM Osc. Coil	360628-1				
L8	AM Loop Stick	460894-3				162 Microhenries
L9	RF Choke	360522-9	19-1002		4606	2 Microhenries
L10	RF Choke	360522-9	19-1002		4606	2 Microhenries
L11	AM-RF Coil	360348-2			A-5495-RF	
L12	AM-Osc. Coil	360407-2	14-1033			
L13	1st. FM IF	360626-1	16-3487	FM-254	1463	
L14	1st. AM IF	360611-1	16-6758	BC-352	12-C1	
L15	2nd. FM IF	360626-1	16-3487	FM-254	1463	
L16	2nd. AM IF	360625-1	16-6770	BC-355	12-C6	
L17	10KC Filter	360621-1				
L18	Ratio Det.	360627-1	17-3498	FM-255	1465	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	MAGNAVOX PART No.	SYLVANIA PART No.	NOTES
M1	1N34A	530030-3	1N34A	Audio Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M2	Dial Light	180161-17	#1847
M3	Dial Light	180161-17	#1847
M4	Dial Light	180161-17	#1847
M5	Tuning Cap.	260137-1	6 Gang (AM Sections: 30-550MMF, 24-525MMF, 16-190MMF)
M6	Switch	160255-1	Bandswitch (Rotary-wafer type) 2 gang
M7	Switch	160252-3	Selector (Rotary-wafer type)
	Glass	150426-1	
	Pointer	102449-1	

PROPERTY OF
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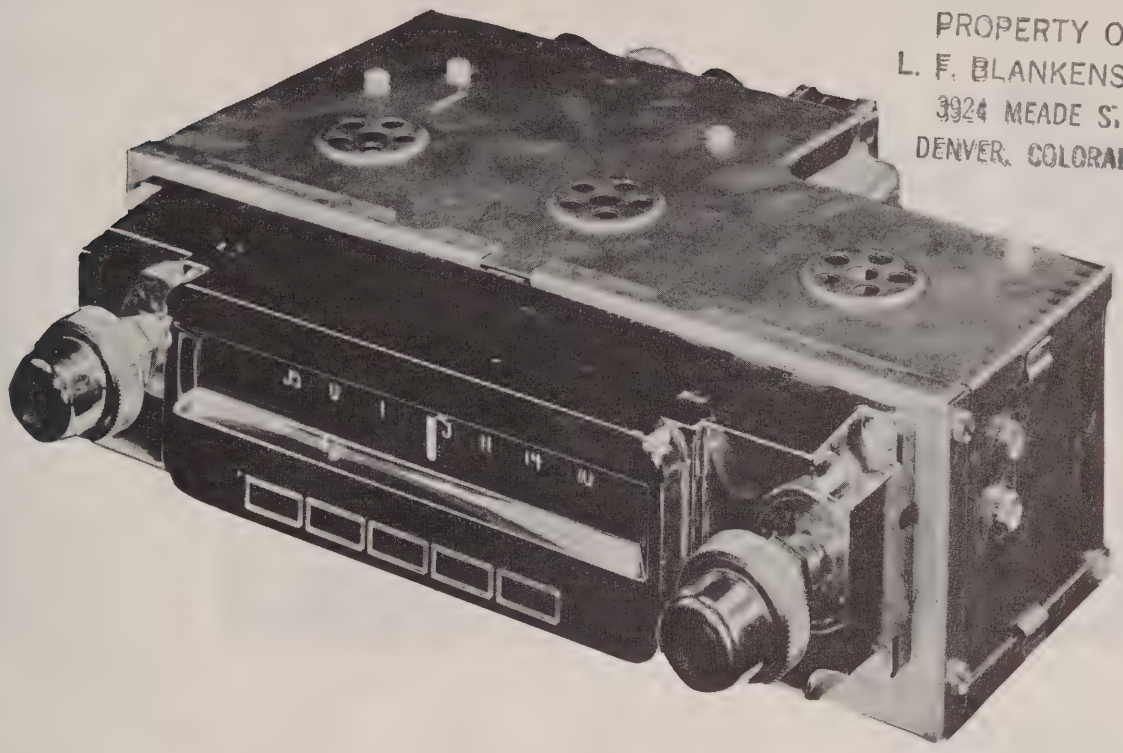
MOPAR
MODELS 620, 621



MOPAR
MODELS 620, 621

TRADE NAME	Mopar Models 620 (Plymouth P28, P29), 621 (Dodge D62, D63)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built AM Automobile Receiver
TUBES (Six)	Types 12BA6RF Amplifier, 12BE6 Converter, 12AU6 IF Amplifier, 12AV6 Det-AVC-AF Amp., 12AB5 Output, 12X4 Rectifier
POWER SUPPLY	12 Volt Storage Battery — RATING 2.8 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Set tone control to high.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	455KC (400~ Mod)	High frequency end of dial.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to antenna receptacle.	1610KC	"	"	A5, A6, A7	"
	Step 3 is unnecessary unless tuner has been tampered with or components replaced. To expose tuning core screws, remove escutcheon. Back tuning cores out of coils but not out of coil forms.						
	Repeat step 2.						
3.	Fig. 1	Thru dummy to antenna receptacle.	1400KC	Back core carriage 13/64" out from end stop.	Across voice coil.	A8, A9, A10	Adjust for maximum output. (Use alignment tool no. 66A76278.)
	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum volume.						

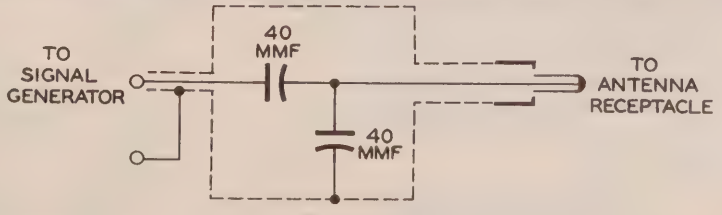


FIG. 1

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1957 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under international Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12AU6	
V4	Det-AVC-AF Amp.	12AV6	
V5	Output	12AB5	
V6	Rectifier	12X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■15	350	23A485677	AFH3-104	CO770	FP328	TMT-89	T-455	TVL-3630
B	▲10	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	22		21R120539							
C3	.006	400	8R121001	SI6000		CUB6D6	GP-6000	GEM-626	6TM-D6	
C4	.05	200	8R121005	BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C5	.05	400	8R121567	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C6	.005	400	8R121787	BPD-005	D6-502	CUB6D5	GP-5000	GEM-625	6TM-D5	
C7	.005	400	8R121787	BPD-005	D6-502	CUB6D5	GP-5000	GEM-625	6TM-D5	
C8	.03	400	8R121574	BPD-03	DF-303	CUB6S3		GEM-613	6TM-S3	
C9	470		21R410121	BPD-00047	DD-471	K060	ED-470	UC-5347	5GA-T47	
C10	.003	600	8R121569	BPD-003	D6-302	CUB6D3	GP-3000	GEM-623	6TM-D3	
C11	.04	1000	8R121549	P1088N-04		CUB16S4		GEM-1014	10TM-S4	
C12	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	
C13	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	
C14	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	18K536151		RTV-539C			Tone (Note 1)
B	250K	½						Volume
C	Switch							

Note 1: Part #18B532519 used in model 621.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	470K		6R6032	BTS-470K	
R3	220Ω		6R6270	BTS-220	
R4	33K		6R6012	BTS-33K	
R5	22K		6R6028	BTS-22K	
R6	390Ω		6R5554	BTS-390	
R7	12K	1	6K533221	BTA-12K	
R8	1Meg		6R6004	BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R9	10Meg		6R2109	BTS-10Meg	
R10	1Meg		6R6004	BTS-1Meg	
R11	220K		6R6015	BTS-220K	
R12	270Ω	1	6R6336	BTA-270	
R13	2200Ω	1	6A533220	BTA-2200	
R14	47Ω	2	6R488035	BTB-47	Note 1

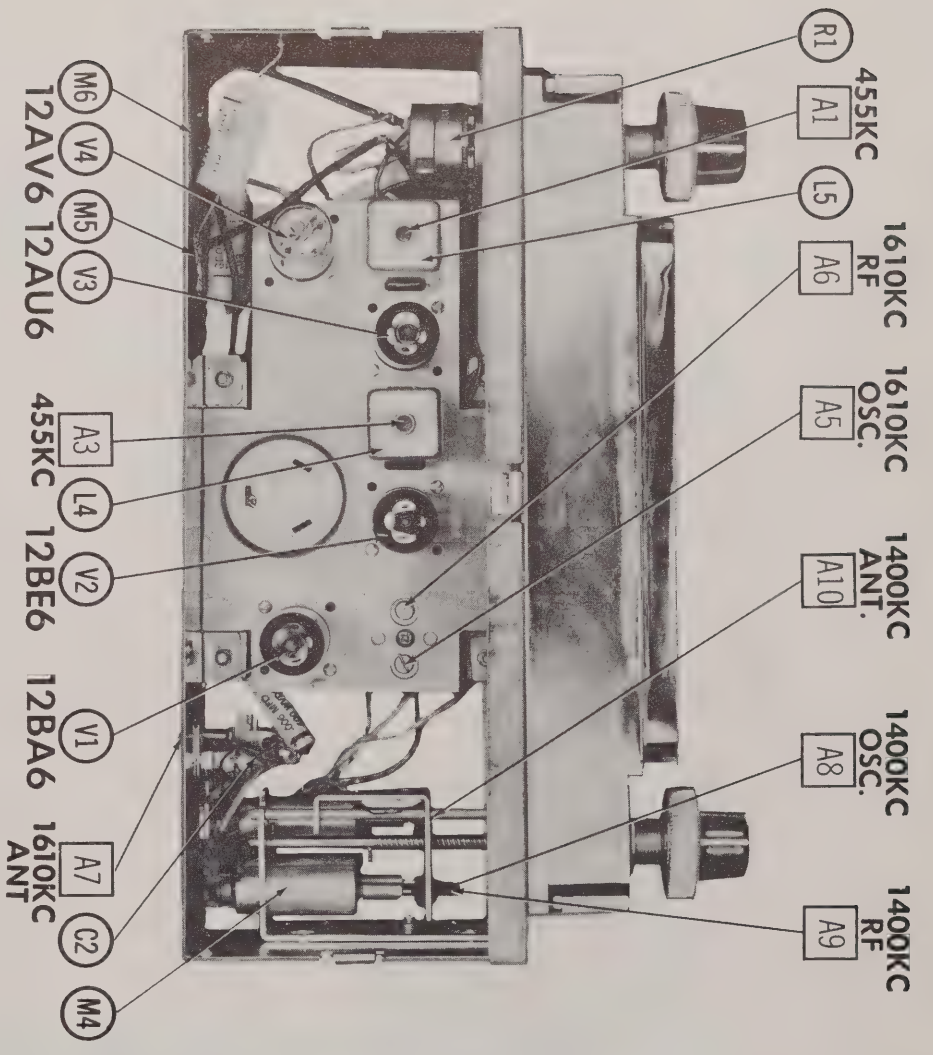
Note 1: 27Ω 2W used in model 621. (Part #6R3994)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6VCT @1.7A	540VCT @.050A			25K535795-0	V3903 ①	P-2978 ①	P-6495	22R52 ①	

① Use original shell.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6000Ω	3-4Ω	25B532839-E	Z1113 ①	A-2930①	A-3877①	24S51 ①	S-3X ①	① Use original channel.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	7"	PM	3-4Ω	50C534811 ①	7A21	① Used in model 620.
				50C533218 ②		② Alternate speaker for model 620.
	6" X 9"	PM	3-4Ω	50C533194 ③	69A2	③ Used in model 621.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	24B533934				Core part #76K536591.
L2	RF Coil	24B533936				Core part #76K536591.
L3	Osc. Coil	24B533937				Core part #76K536535.
L4	Input IF	24C485553	16-6758	BC-352	12-C1	
L5	Output IF	24K485554	16-6770	BC-355	12-C6	
L6	Vib. Hash Choke	24A534494				

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6V	115~	48B522000	6301	G859	6301	

FUSES

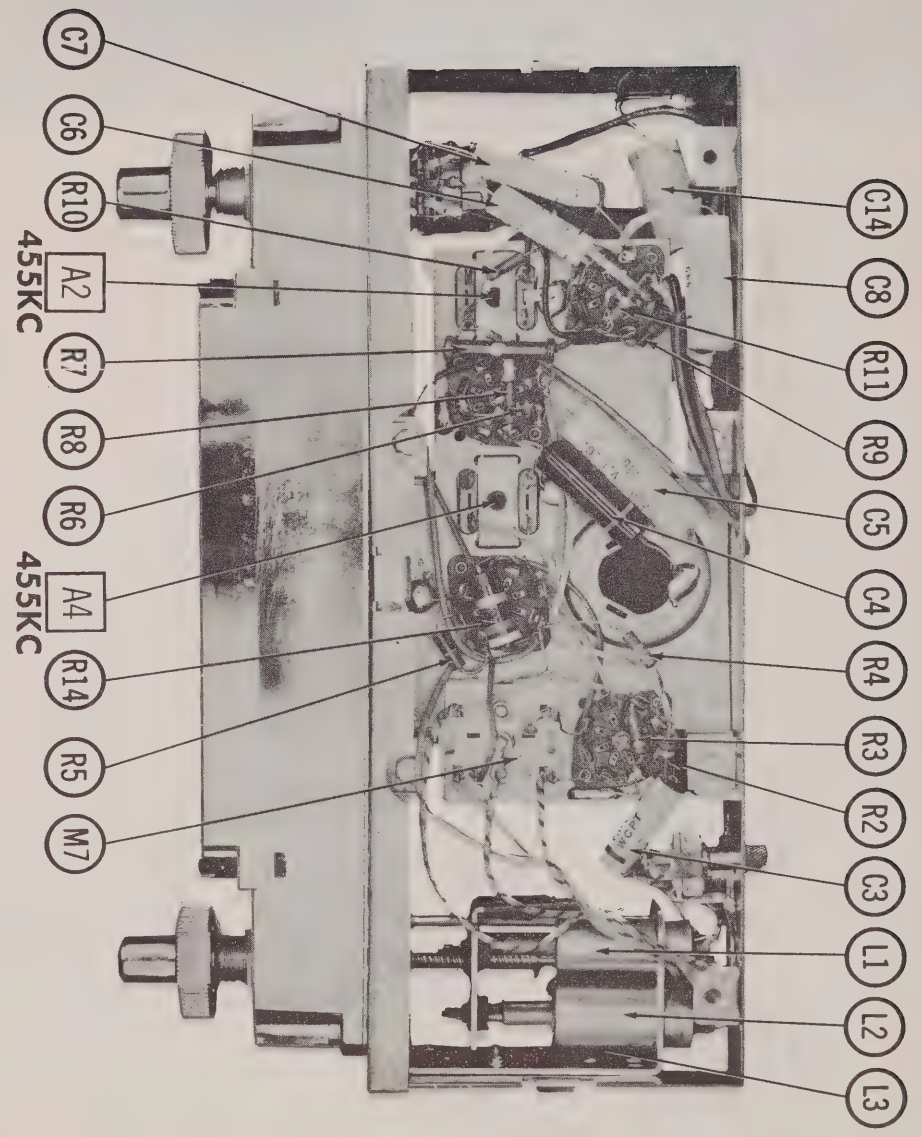
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	9A	65K16248	*9C535716	307009. (SFE-9A)	155009	SFE9	HRH

* Part no. 9K535717 used in model 621.

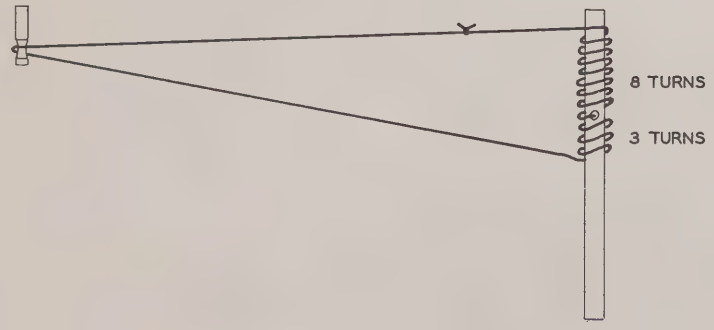
MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Light	65X11854	#47, Model 620.
	Dial Light	65X10867	#44, Model 621.
M4	Tuner	77K536147	MT-174. Permeability, Complete; Model 620. Includes L1, L2, L3.
	Tuner	77K533236	MT-147. Permeability, Complete;Model 621. Includes L1, L2, L3.
M5	Spark Plate	64K532087	12. 6V Power Input Lead.
M6	Spark Plate	64K532087	Filament.
M7	Trimmer Cap.	20B532668	Dual: Osc. (A5) 420-490MMF;RF (A6) 7. 5-75MMF. Unit also consists of 4. 5MMF and 47MMF. Fixed Capacities.
A7	Trimmer Cap.	20B532806	Ant. (50-240MMF)
	Knob	36B533005	Tone & Dummy, Model 620.
	Knob	36B532949	Tone & Dummy, Model 621.
	Knob	1V533308	On-Off-Volume & Tuning, Model 620.
	Knob	1V533109	On-Off-Volume & Tuning, Model 621.
	Dial Crystal	61K532894	Model 620.
	Dial Crystal	61K532893	Model 621.
	Dial Scale	34C533018	Model 620.
	Dial Scale	34K535143	Model 621.
	Dial Pointer Ass'y.	1K532802	Model 620.
	Dial Pointer Ass'y.	1K532655	Model 621.

CHASSIS—BOTTOM VIEW

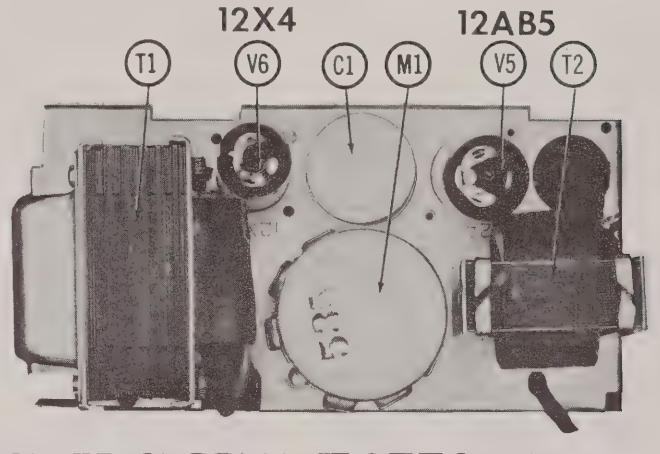


TUNING SLUGS SET TO HIGHEST FREQ. SETTING.

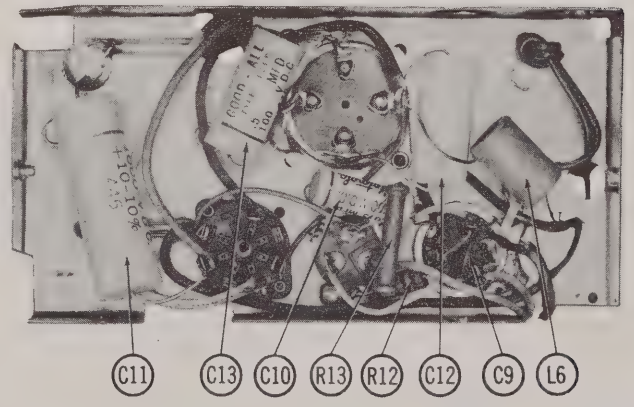


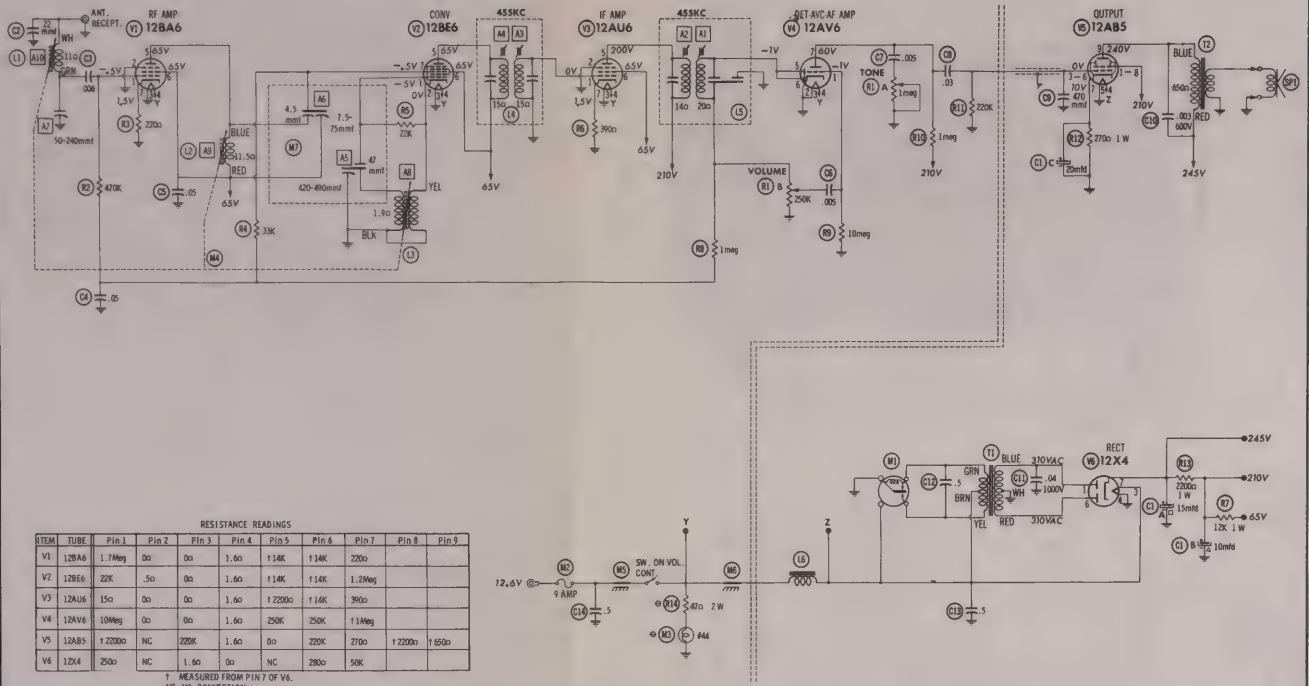
DIAL CORD STRINGING

POWER SUPPLY - TOP VIEW



POWER SUPPLY - BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	1.7Meg	0Ω	0Ω	1.6Ω	↑14K	↑14K	220Ω		
V2	12BE6	22K	.5Ω	0Ω	1.6Ω	↑14K	↑14K	1.2Meg		
V3	12AU6	15Ω	0Ω	0Ω	1.6Ω	↑2200Ω	↑14K	390Ω		
V4	12AV6	10Meg	0Ω	0Ω	1.6Ω	250K	250K	↑1Meg		
V5	12AB5	↑2200Ω	NC	220K	1.6Ω	0Ω	220K	270Ω	↑2200Ω	↑650Ω
V6	12X4	250Ω	NC	1.6Ω	0Ω	NC	280Ω	50K		

↑ MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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RETMA MEMBER

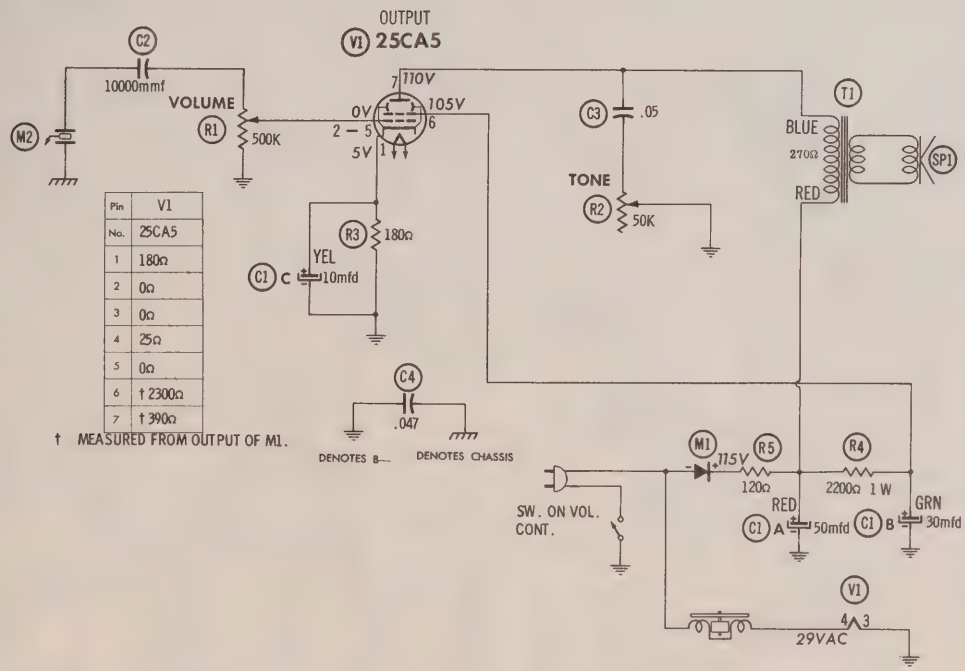
MOTOROLA MODELS 27F1, 27F2 (Ch. HS-540)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

MOTOROLA MODELS
27F1, 27F2 (Ch. HS-540)

MOTOROLA MODELS
27F1, 27F2 (Ch. HS-540)

TRADE NAME	Motorola Models 27F1, 27F2 (Ch. HS-540)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Manual Record Player
TUBES (One)	Type 25CA5 Output
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .39 Amp. @ 117 Volts AC



Pin No.	V1 25CA5
1	180Ω
2	0Ω
3	0Ω
4	25Ω
5	0Ω
6	† 2300Ω
7	† 390Ω

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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350-11

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25CA5	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	23K634545	PRS150/25V 5030/20	BBRT5315C	TCT3107	TDLT-15	FMT-327	TVA-3430
B	30	150							
C	10	10							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10000		21R121946	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C3	.05	200	8R121005	BPD-05	DF-503	CUB2S47	GEM-415	PT415	2TM-S5	
C4	.047	400	8K490232	BPD-05	DF-503	CUB4S47	GEM-4147		4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	18A636216	B-60-S	A47-500K-Z	Q13-133	U48	Volume (Note 1)
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	
R2A	50K	½	18A636207	B-31	A47-50K-S	Q11-123	U35	Tone
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

Note 1: Alternate part no. 18A636208 used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R3	180Ω		6R5660	BTS-180	
R4	2200Ω	1	6R6146	BTA-?200	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R5	120Ω		6R5551	BTS-120	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4350Ω	3-4Ω	25B634544	Z1000 ①	A-3026	A-3877①	22S46 ①	S-6X	① Drill one new mtg. hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	50D634563-A①	4A07	① Alternate part #50B634563

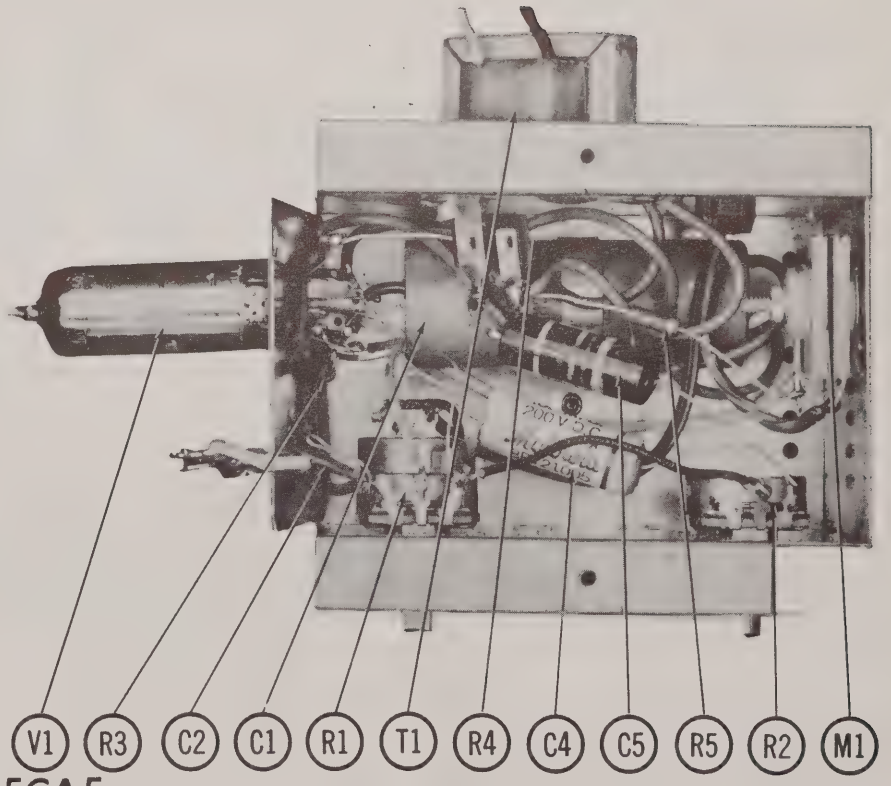
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	MOTOROLA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.040A	48K791092	1386	RS050	6S65	8J1	65	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	MOTOROLA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	59C634613	*B-310-T				*Complete Tone Arm & Cartridge Assembly.

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	MOTOROLA PART No.	JENSEN PART No.	WALCO PART No.	
M3	47K632856	*JP-35 or †JP-S35 or †♦JPS-35SD or ♦JPS-35D	†W-33TPS or †♦-33DS or ♦W-33TPD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

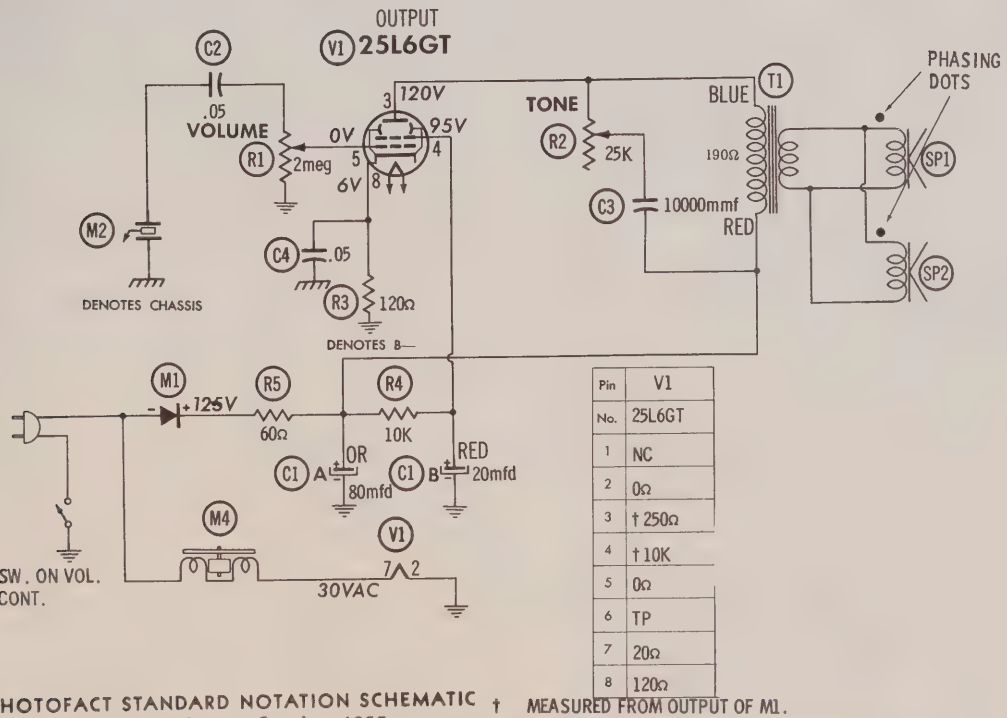
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
	Cabinet	1V636347	Red & Tweed
	Cabinet	1V636348	Two-Tone Blue
	Handle	55K634570	Black
	Knob	36K636215	Tone-Black
	Knob	36C636214	Volume-Red

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PHILCO
MODELS E-1351, E-1353

PHILCO
MODELS E-1351, E-1353

TRADE NAME	Philco Models E-1351, E-1353
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	AC Operated Phono Amplifier With Manual Record Player
TUBES (One)	Type 25L6GT Output
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .38 Amp. @ 117 Volts AC



Pin No.	V1 25L6GT
1	NC
2	0Ω
3	† 250Ω
4	† 10K
5	0Ω
6	TP
7	20Ω
8	120Ω

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.
TP TIE POINT.

350-12

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	30-2575-42	PRS150V2080	BBRT44215	TCT3116	TDLD-10	FMT-315	TVA-2460
B	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10000		30-1238-2	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C3	.05	400	30-4650-45	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C4	.05	400	30-4650-45	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	33-5585-5	B-76-S	A47-2Meg-Z	Q13-139	U55	Volume (Note 1)
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	
R2A	25K	½	33-5565-109	AB-29		Q13-120	U28A	Tone
B	Shaft			AK-3		Not Req.	Not Req.	

Note 1: Earlier production used alternate part no. 33-5566-78 (500K).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R3	120Ω		66-1128340	BTS-120	
R4	10K		66-3108340	BTS-10K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R5	60Ω	1½	33-1334-18	BTB-68	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2750Ω	3-4Ω	36-1654-17 ①② 32-8310-3 ③	Z1101	A-3025	A-3332	22S45 ④	S-12X	① Part # includes SP1. ② Used in model E-1353 only. ③ Used in model E-1351 only. ④ Drill one new mtg. hole.

SPEAKER

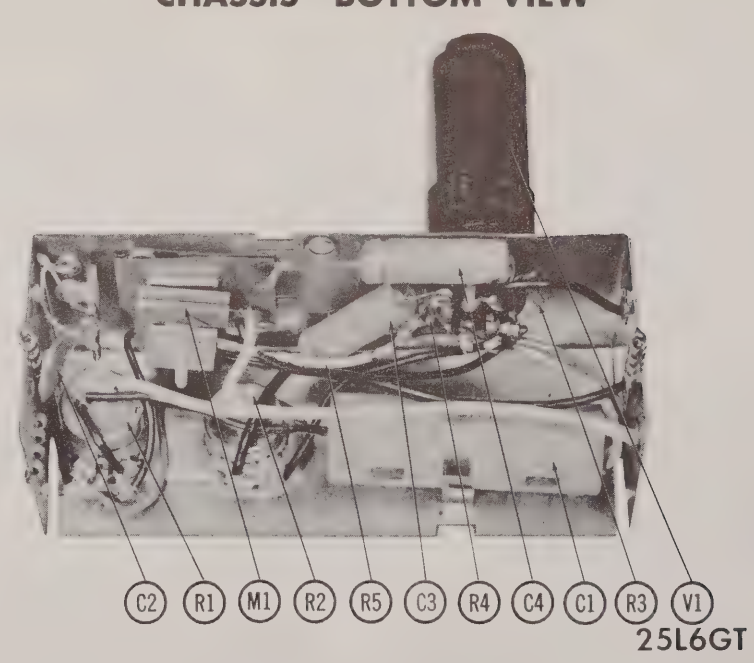
ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	36-1654-17 ①②④ 36-1654-4 ③	4A07 ④	① Used in model E-1353 only. ② Part # includes T1. ③ Used in model E-1351 only. ④ Connect in parallel & phase.
SP2	4"	PM	3-4Ω	36-1654-18 ①④	4A07 ④	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	PHILCO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.048A	34-8030-1*	1386	RS065Q	6S65	8J1	65	

* Alternate part #34-8003-23.

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	PHILCO PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2	325-8004	310-TS *BR-310T	N8-1 & N8-3			*Pick-up

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHILCO PART No.	JENSEN PART No.	WALCO PART No.	
M3		†CRA-55 or †CRA-55LP or ♦CRA-55D or ♦CRA-55LPD		† Jewel ♦ Diamond

MISCELLANEOUS

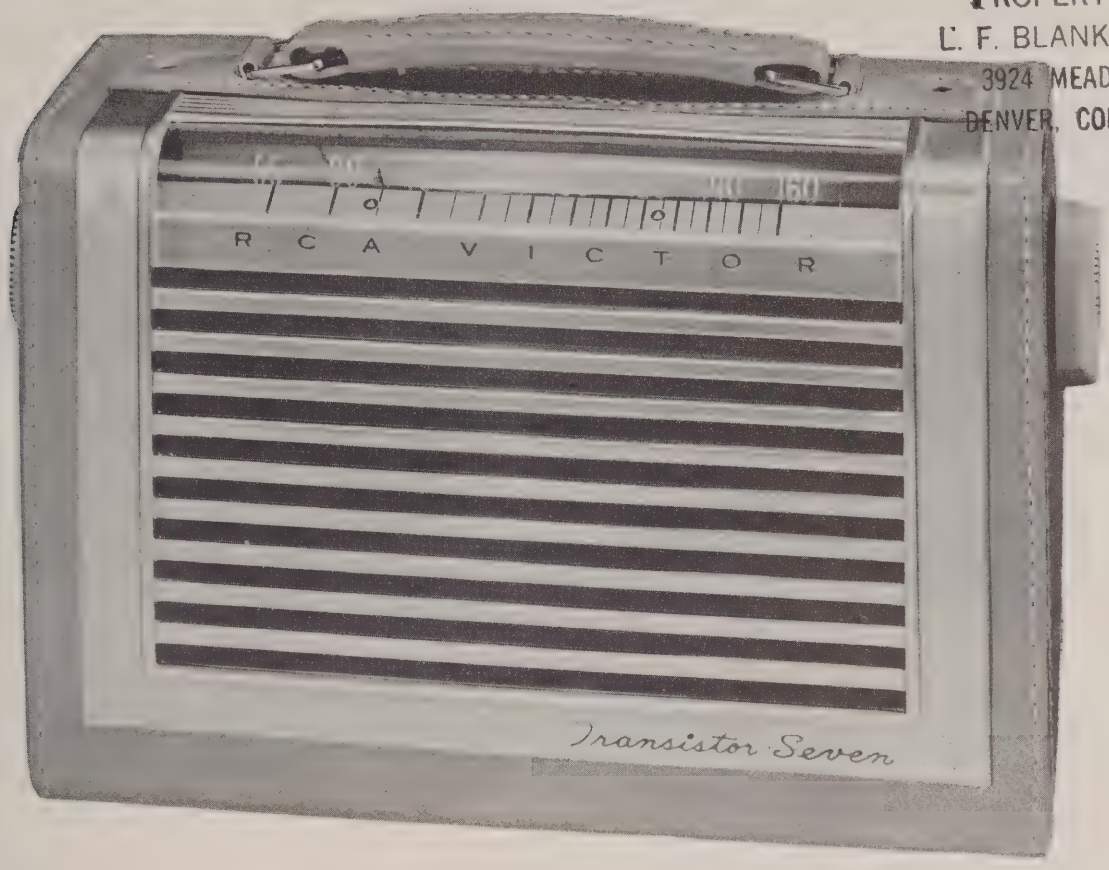
ITEM No.	PART NAME	PHILCO PART No.	NOTES
M4	Motor	35-2761*	4 Speed (90VAC) Model E-1353.
	Motor	35-1515	3 Speed (90VAC) Model E-1351.
	Cabinet	11210	Tan, Model E-1353.
	Cabinet	11212-1	Charcoal & Ivory, Model E-1351.
	Cabinet	11212	Ginger, Model E-1351.
	Handle	54-5210-5	Model E-1353, E-1351 (Charcoal & Ivory)
	Handle	54-5210-6	Model E-1351 (Ginger)
	Knob	54-4842-18	2 Used. Model E-1353.
	Knob	54-4843-11	2 Used. Model E-1351.

*Alternate part no. 35-1537.

RCA VICTOR MODEL 8-BT-10K (Ch. RC-1156A)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

RCA VICTOR MODEL
8-BT-10K (Ch. RC-1156A)



RCA VICTOR MODEL
8-BT-10K (Ch. RC-1156A)

TRADE NAME	RCA Victor Model 8-BT-10K (Ch. RC-1156A)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N.J.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volt Battery — RATING 8.5 MA @ 9 Volts DC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.005MFD	High side to antenna stator lug on gang. Low side to chassis.	455KC (400∿Mod)	Point of non-interference	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.		Loop	1620KC	Tuning gang fully open	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A5	"
4.		"	600KC	Tune to 600KC signal	"	A6	Adjust for maximum output while rocking tuning gang.

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PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL 8-BT-10K (Ch. RC-1156A)

TRANSISTORS

ITEM No.	USE	TYPE	NOTES
X1	Converter	2N140	
X2	1st. IF Amplifier	2N139	
X3	2nd. IF Amplifier	2N139	
X4	AF Amplifier	2N109	
X5	Driver	2N109	
X6	Output	2N109	
X7	Output	2N109	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	10	10	101613	XPP12V10	NL10-10	TAP25-10	ML10-15	MMT-0210	TE-1114
C2	10	10	101613	XPP12V10	NL10-10	TAP25-10	ML10-15	MMT-0210	TE-1114
C3	10	10	101613	XPP12V10	NL10-10	TAP25-10	ML10-15	MMT-0210	TE-1114
C4	100	25	101724	SRE25V100	BBR100-25	TC2501	TD-100-25	MTH-2510	TVA-1207
C5	100	25	101724	SRE25V100	BBR100-25	TC2501	TD-100-25	MTH-2510	TVA-1207
C6	100	25	101724	SRE25V100	BBR100-25	TC2501	TD-100-25	MTH-2510	TVA-1207

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	.1	200	79251	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C8	.1	200	79251	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C9	.047	200	78721A	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C10	.1	200	79251	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C11	.1	200	79251	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C12	.01	200	101000	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C13	.01	200	101000	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C14	.022	200	102080	BPD-02	DF-203	CUB2S2		GEM-4122	2TM-S22	
C15	.1	200	79251	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	5000Ω	½	102628	B-11		Q13-114	U12	Volume
B	Shaft			Not Req.		Not Req.	Not Req.	
C	Switch			KB-2		76-2	US-27	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

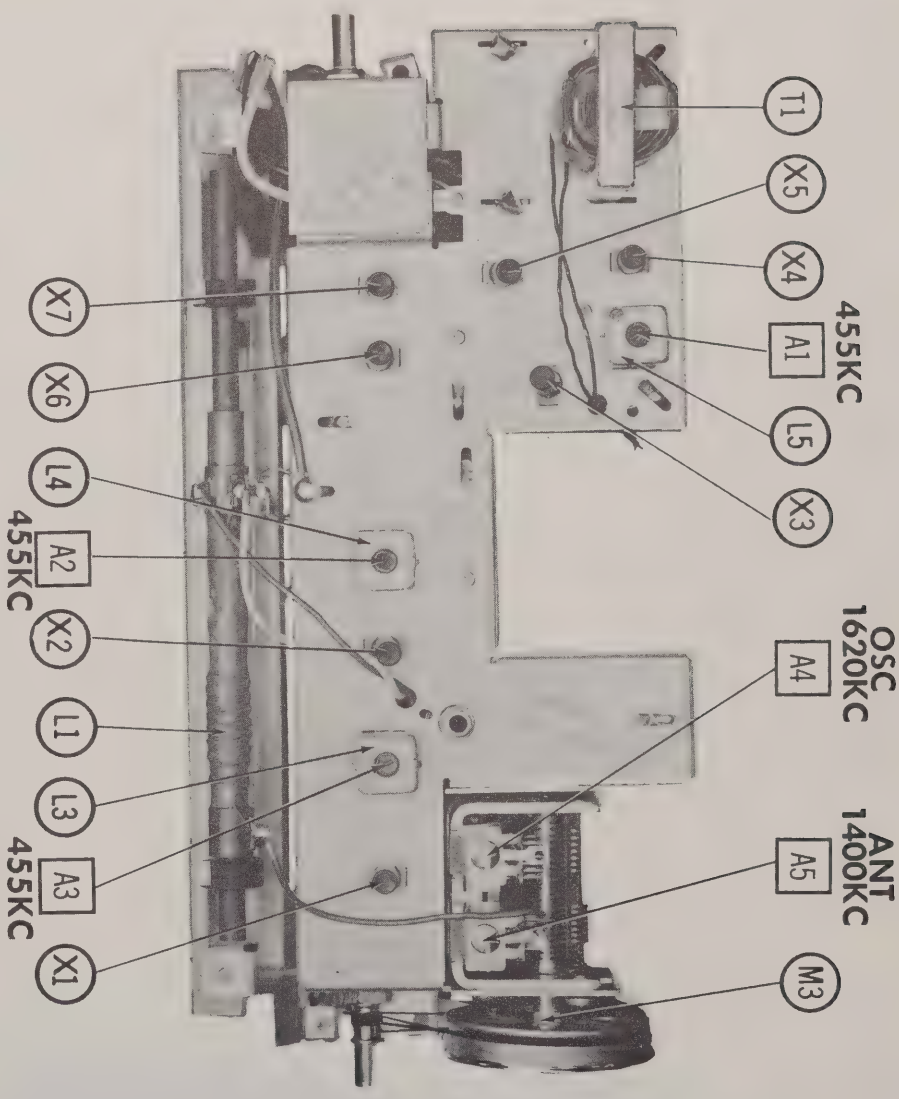
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R2	470Ω		502147	BTS-470	
R3	3900Ω		502239	BTS-3900	
R4	100K		502410	BTS-100K	Note 1
R5	1000Ω		502210	BTS-1000	
R6	1000Ω		502210	BTS-1000	
R7	3900Ω		502239	BTS-3900	
R8	5600Ω		502256	BTS-5600	
R9	5600Ω		502256	BTS-5600	
R10	5600Ω		502256	BTS-5600	
R11	5600Ω	5%	502256	BTS-5600	5%
R12	6200Ω	5%	502262	BTS-6200	5%
R13	6200Ω	5%	502262	BTS-6200	5%
R14	33K		502333	BTS-33K	
R15	6800Ω		502268	BTS-6800	
R16	560Ω		502156	BTS-560	
R17	33K		502333	BTS-33K	
R18			101822		Note 2
R19	390Ω	5%	30498	BTS-390	5%
R20	100Ω		502110	BTS-100	
R21	3600Ω	5%	502236	BTS-3600	5%
R22	100Ω		502110	BTS-100	

Note 1. Not used in some versions.
Note 2. Special temperature compensation type resistor (270Ω 72° F, 40Ω @ 160° F)

TRANSFORMER (DRIVER)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.5:	1	101656				TR-3 ①		① Drill new mounting holes.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	460Ω	3-4Ω	101657				TR-27①		① Drill new mounting holes.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA: RCA Victor PART No.	QUAM PART No.	NOTES
SP1	4" x 6"	PM	3-4Ω	102634	46A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Stick	101650				
L2	Osc. Coil	102766	14-9010			
L3	1st. IF Trans.	102631	16-9012			
L4	2nd. IF Trans.	102632	16-9013			
L5	3rd. IF Trans.	102633	16-9014			

BATTERIES

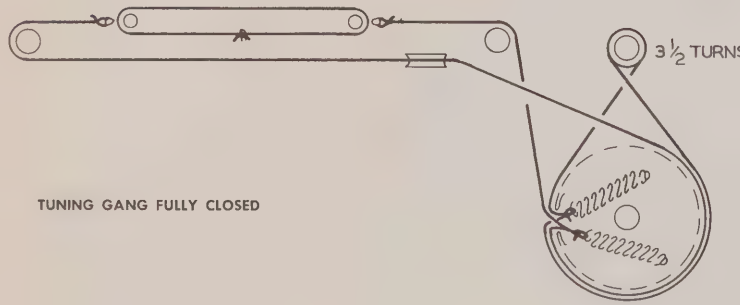
ITEM No.	VOLTAGE	RCA Victor PART No.	REPLACEMENT DATA: EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M1	9V (Tapped)	VS-301		2506					

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: RCA Victor PART No.	SYLVANIA PART No.	NOTES
M2	1N295	101615	1N60	Audio Detector (Pigtail)

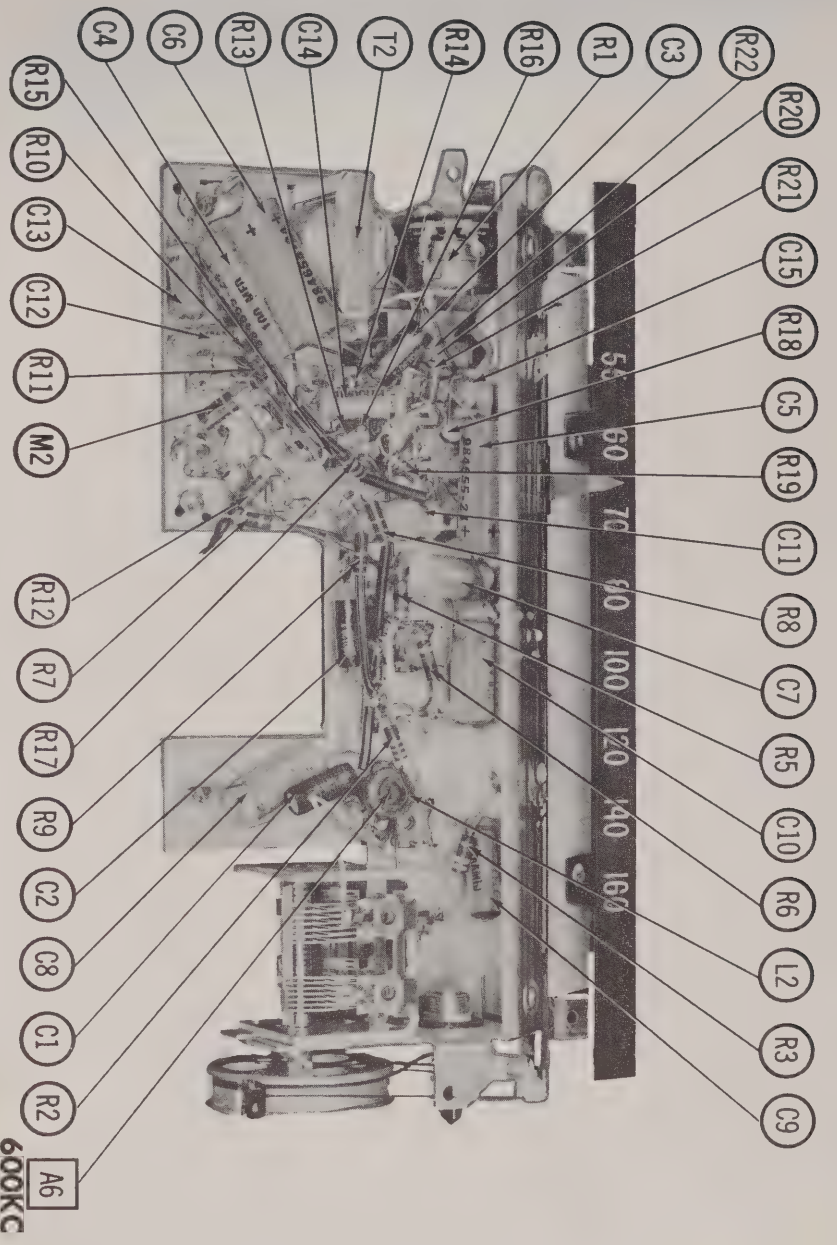
MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M3	Tuning Cap.	101653	Two gang (17-185MMF, 17-95MMF)
	Knob	101662	Tuning
	Knob	102635	Volume
	Handle	101646	



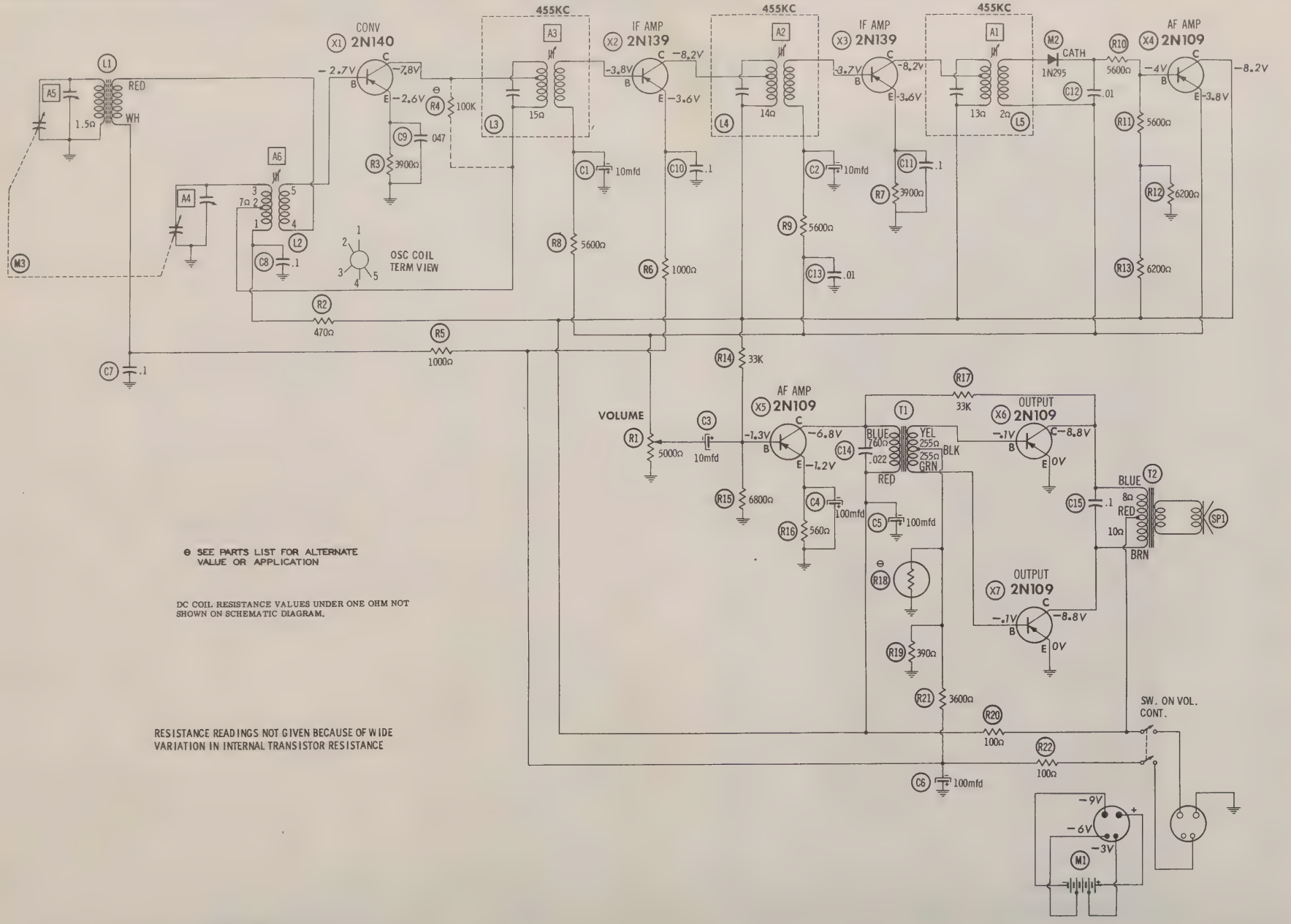
DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



RCA VICTOR
MODEL 8-BT-10K (Ch. RC-1156A)

RCA VICTOR
MODEL 8-BT-10K (Ch. RC-1156A)



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

RESISTANCE READINGS NOT GIVEN BECAUSE OF WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SILVERTONE MODEL 7222 (Ch. 528.48000)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SILVERTONE MODEL
7222 (Ch. 528.48000)

SILVERTONE MODEL
7222 (Ch. 528.48000)

TRADE NAME	Silvertone Model 7222 (Ch. 528.48000)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Illinois
TYPE SET	Three Power Portable AM Receiver
TUBES (Five)	Types 1U4 RF Amplifier, 1R5 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY RATING	110-120 Volts AC-DC (or) 9 Volts "A" Supply & 90 Volts "B" Supply in Pack Form .17 Amp. @ 117 Volts AC (or) 65MA @ 9 Volts DC & 7.5 MA @ 90 Volts DC
TUNING RANGE—BROADCAST	535KC-1610KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1U4 (V3). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2,	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	High side to pin 6 (grid) of 1R5 (V2). Low side to B-.	"	"	"	A3, A4	"
3.	"	"	1610KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		Loop	1400KC	Tune to 1400KC signal	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. (A7 located on bar antenna).

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PARTS LIST AND DESCRIPTIONS

SILVERTONE
MODEL 7222 (Ch. 528. 48000)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	1U4	
V2	Converter	1R5	
V3	IF Amplifier	1U4	

ITEM No.	USE	TYPE	NOTES
V4	Det. -AVC-AF Amp.	1U5	
V5	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■90	150	18-28-3			FP314		T-045	
B	▲30	150				TC49		MTH-1525	
C	200	15							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	200	16-50323	BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C3	2. 2		20-5-0	NP0-SI 2. 2	TCZ-2R2	C10V22C	TCO-2. 2		5TCCB-V22	
C4	10		15-100151	NP0-SI 10	TCZ-10	C10Q1C	TCO-10	ZT-541	5TCC-Q1	
C5	10000		15-10316	BPD-01	DD-103	BYA6S1	GP-10000	DC511	5HK-S1	
C6	2000		15-20216	BPD-002	DD-202	BYA6D2	GP-2000	DC522	5HK-D2	
C7	.1	200	16-10423	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C8	4. 7		20-23-0	NP0-SI 4. 7	TCZ-4R7	C10V47C	TCO-4. 7	ZT-5547	5TCCB-V47	
C9	.05	200	16-50323	BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C10	2000		15-20216	BPD-002	DD-202	BYA6D2	GP-2000	DC522	5HK-D2	
C11	.05	400	16-50343	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C12	.05	400	16-50343	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	24-252					Volume
B	Shaft							
C	Switch							

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R2	4. 7Meg		60-47502	BTS-4. 7Meg	
R3	22K		60-22301	BTS-22K	
R4	100K		60-10402	BTS-100K	
R5	12K		60-12301	BTS-12K	
R6	10Meg		60-10602	BTS-10Meg	
R7	2. 2Meg		60-22502	BTS-2. 2Meg	
R8	47K		60-47302	BTS-47K	
R9	470Ω		60-47101	BTS-470	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R10	1500Ω		60-15201	BTS-1500	
R11	1500Ω		60-15201	BTS-1500	
R12	680Ω		60-68101	BTS-680	
R13	330Ω		60-33101	BTS-330	
R14	2000Ω	10	61-63	PW10-2000	
R15	1500Ω		60-15201	BTS-1500	
R16	110Ω	3	61-64		
R17	10Meg		60-10602	BTS-10Meg	

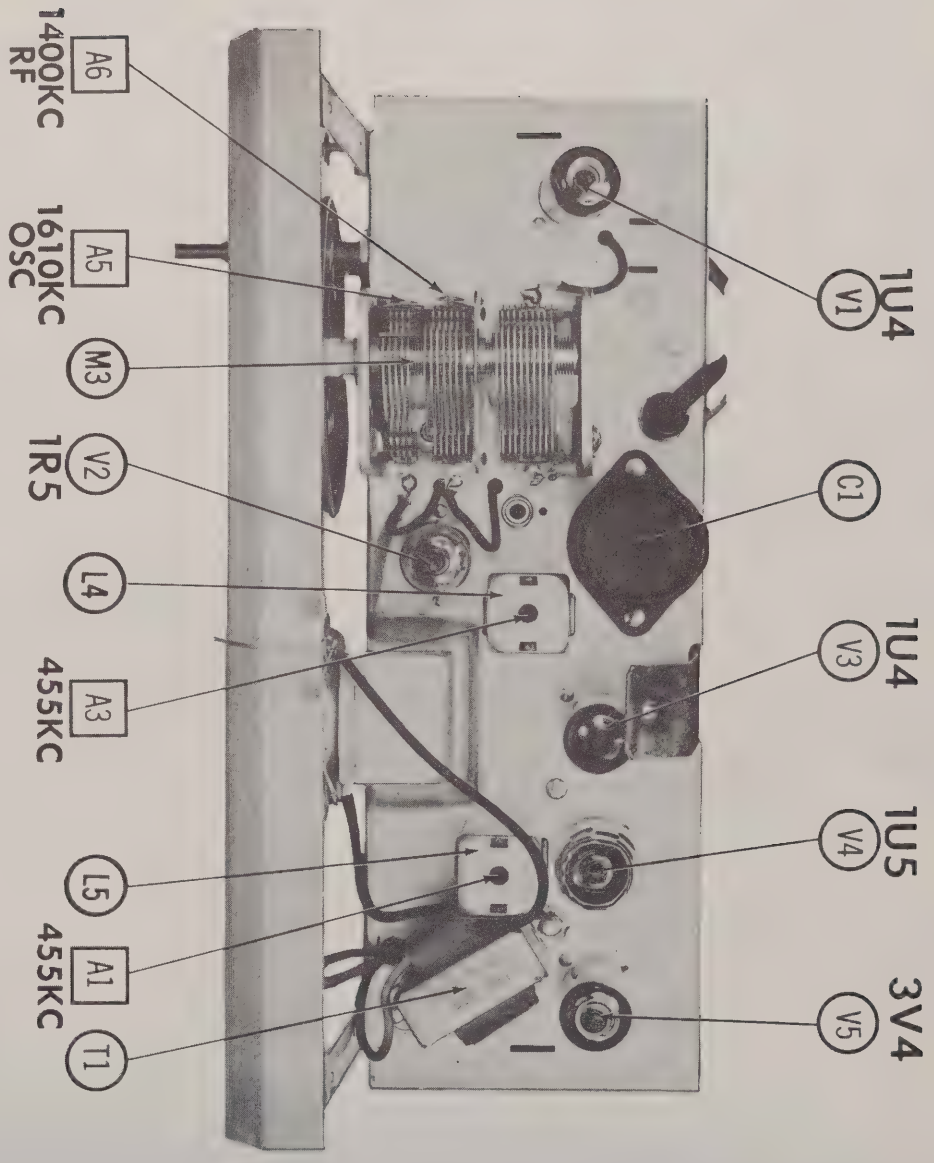
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	8800Ω	3-4Ω	80-313	Z1116①	A-2927①	A-3329	24S49	S-8X	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	4" x 6"	PM	3-4Ω	79-426	46A07	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	82-109				273 Microhenries
L2	RF Coil	10-5-1				416 Microhenries
L3	Osc. Coil	10-6-4				278 Microhenries
L4	Input IF	10-42-2	16-6758	BC-352	12-C1	
L5	Output IF	10-42-2	16-6758	BC-353	12-C2	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA	
K1	Det.-Audio Net.	150MMF, 5000MMF, 2000MMF, 10000MMF, 4.7Meg, 1Meg, 3.3Meg, 10Meg	13-5-3	Aerovox Centralab Sprague	PA521 PC-165 DP-1

SELENIUM RECTIFIER

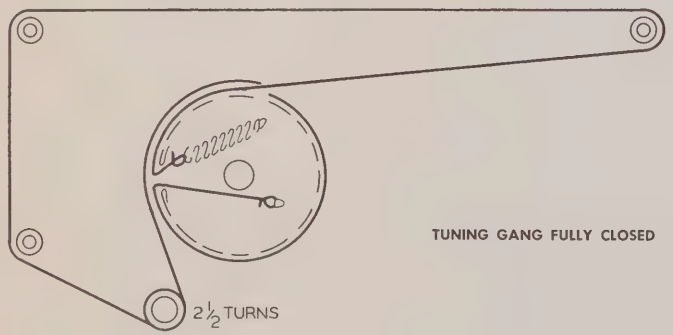
ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	SILVERTONE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.061A	83-568	1003A	RS075	6S75	5M4	75	

BATTERIES

ITEM No.	VOLTAGE	SILVERTONE PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	9V "A" 90V "B"	6407			753			F6A60	

MISCELLANEOUS

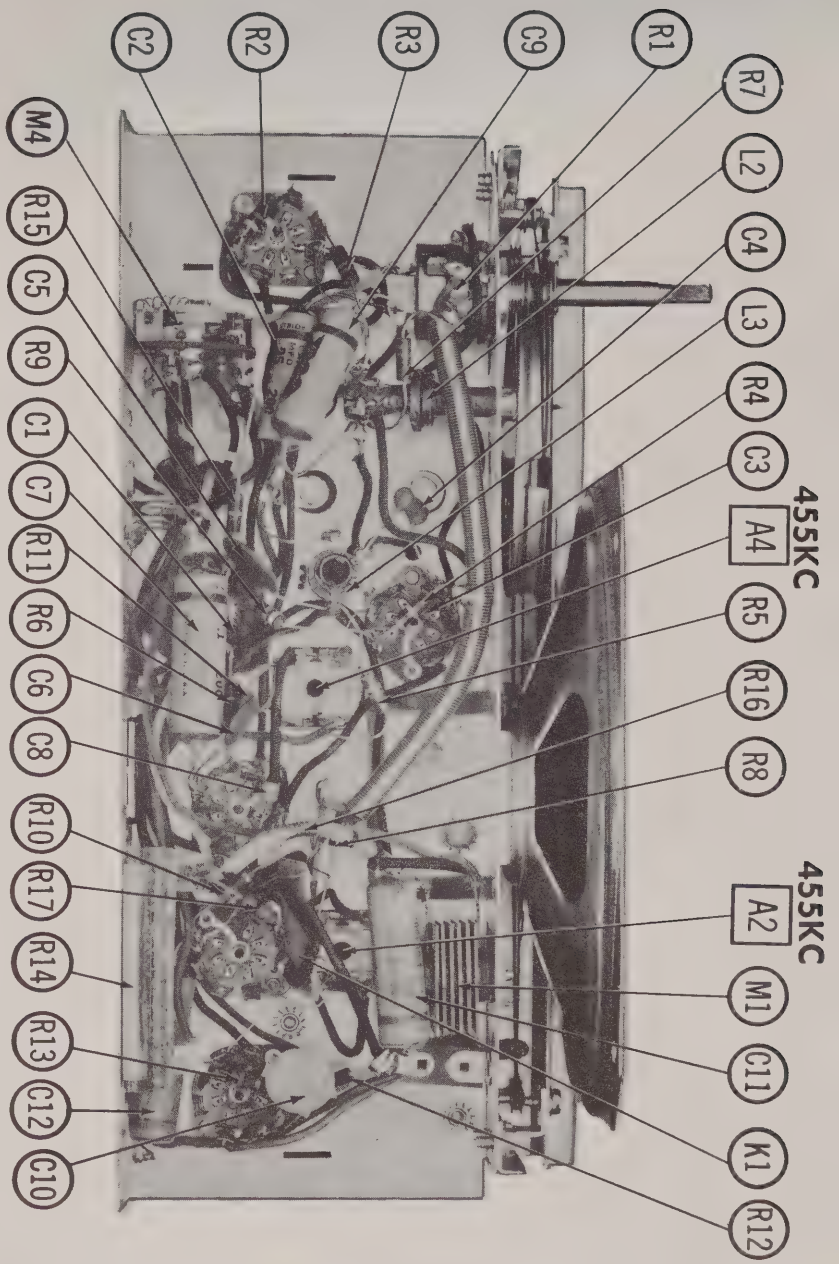
ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuning Cap.	19-258	3 Gang (10-308MMF, 10-206MMF, 10-83MMF) Alternate part #19-49-2
M4	Switch	69-186	Power Change-over
	Knob	52-726	Tuning
	Knob	52-725	On-off-volume
	Glass	48-128	Dial
	Pointer	54-51	Dial
	Cabinet	42-863	



TUNING GANG FULLY CLOSED

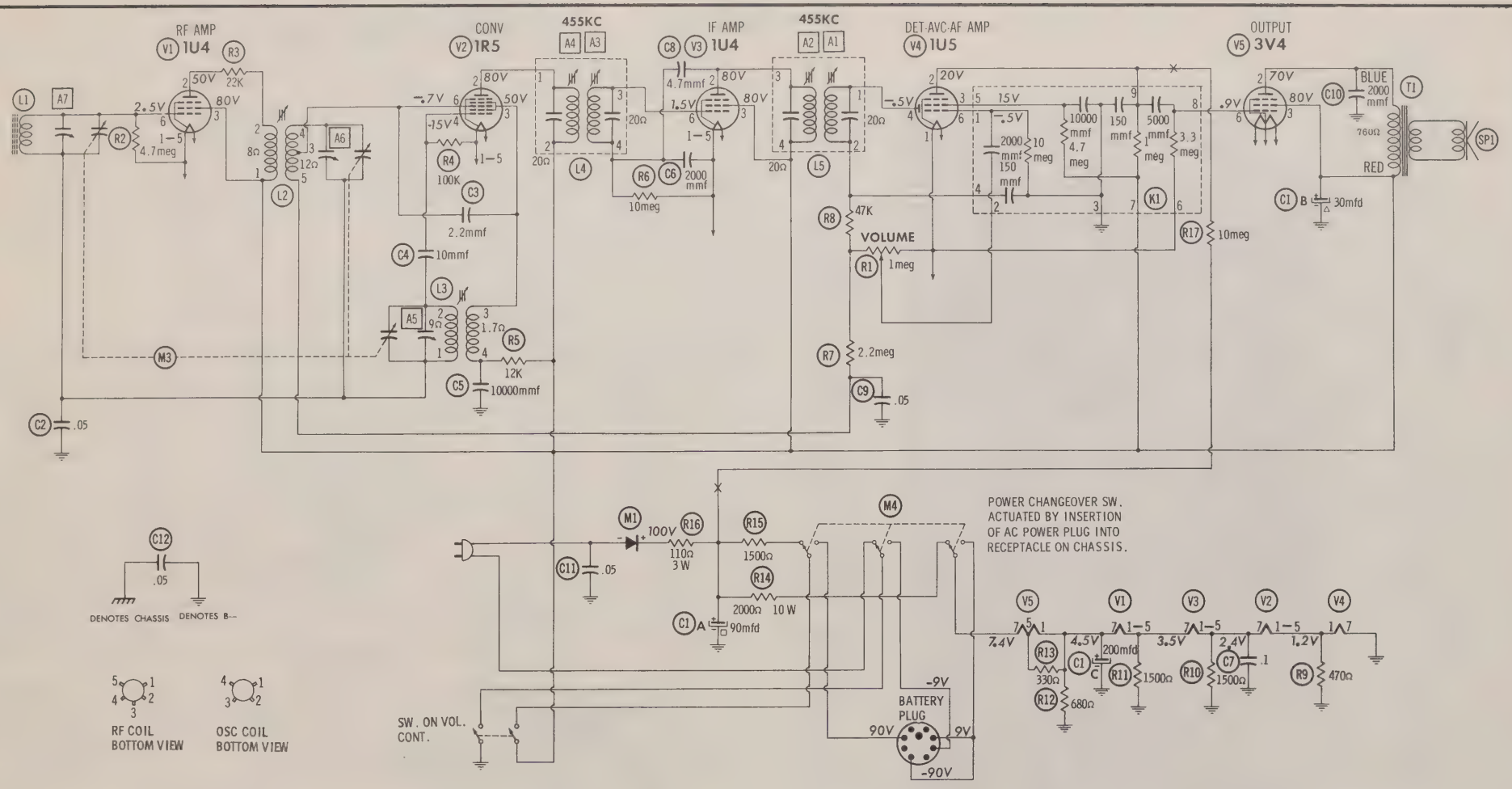
DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



SILVERTONE
MODEL 7222 (Ch. 528, 48000)

SILVERTONE
MODEL 7222 (Ch. 528, 48000)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1U4	•	†24K	†1600Ω	NC	•	4.7Meg	•
V2	1R5	•	†1600Ω	†14K	100K	•	3.2Meg	•
V3	1U4	•	†1600Ω	†1600Ω	NC	•	10Meg	•
V4	1U5	•	†1Meg	†4.7Meg	1Meg	NC	10Meg	•
V5	3V4	•	†2400Ω	†1600Ω	NC	•	3.3Meg	•

• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SONORA
MODELS 607, 608

SONORA
MODELS 607, 608

TRADE NAME	Sonora Models 607, 608
MANUFACTURER	Sonora Radio & Tel. Corp., 325 N. Hoyne Ave., Chicago, Illinois
TYPE SET	Three Power Portable AM Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY	110-120 Volts AC-DC (or) 3 Volts "A" Supply & 67.5 Volts "B" Supply
RATING	.15 Amp. @ 117 Volts AC (or) 110MA @ 3 Volts DC & 9MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	540-1620KC SHORT WAVE

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice Coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

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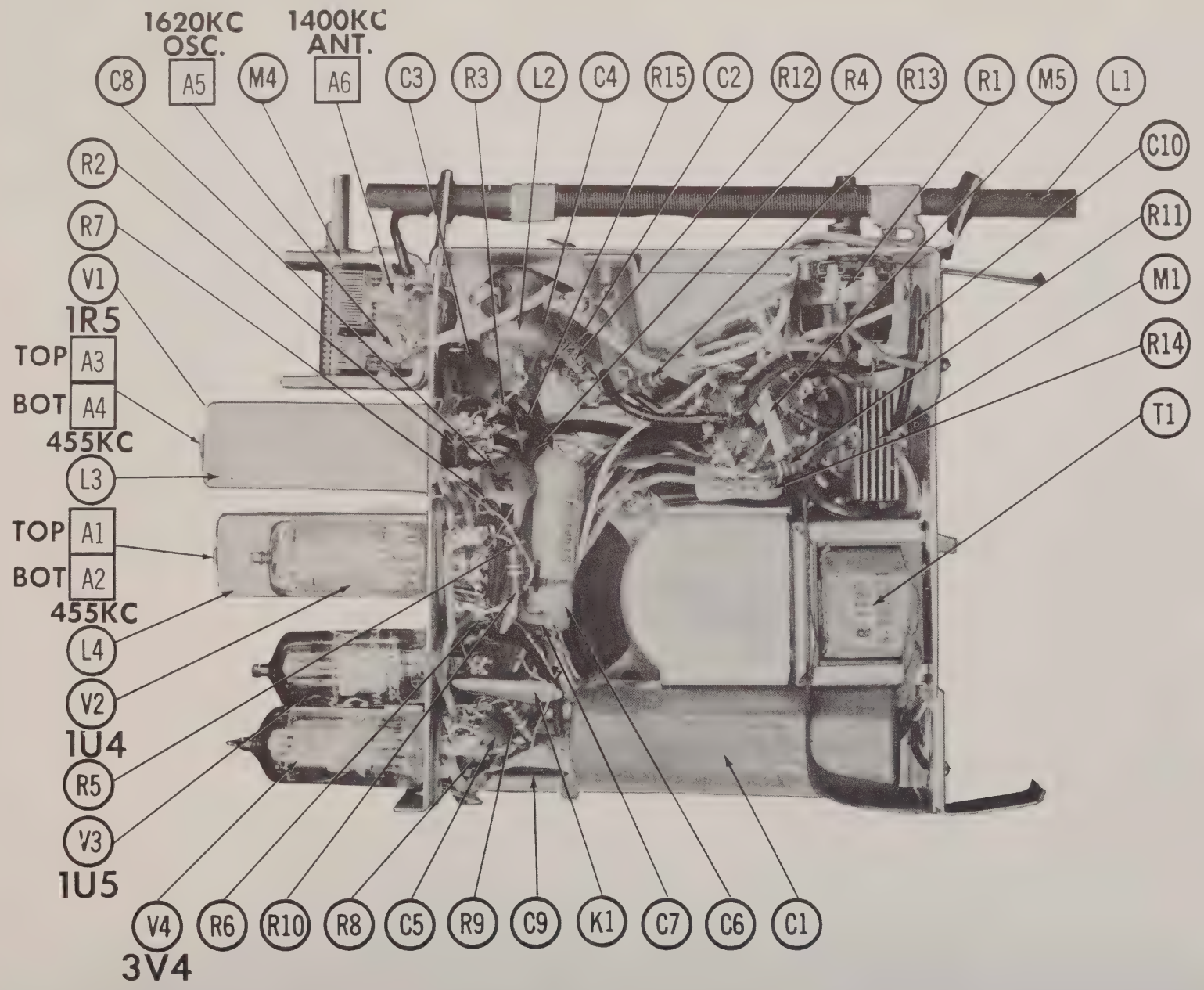


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5	
V2	IF Amplifier	1U4	
V3	Det.-AVC-AF Amp.	1U5	
V4	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SONORA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	150	R-1728	PRS150/25V	BBRT5315	FP309	TDLT-16	FMT-331	TVA-3427
B	30	150		5030/100	C10				
C	100	15							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	20000		R-1760	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C3	5000		N-6272	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C4	50			BPD-00005	DD-500	L10Q50	ED-50	UC-545	5GA-Q5	
C5	2000		R-1105	BPD-002	DD-202	BYA10D2	GP-2000	DC522	5HK-D2	
C6	.047	200	R-1462	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C7	.1	200	N-1351	P288N-1	DF-104	CUB2P1		GEM-401	2TM-P1	
C8	5000		N-6272	BPD-005	DD-502	BYA10D5	GP-5000	DC525	5HK-D5	
C9	20000		R-1760	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C10	20000		R-1760	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SONORA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg		R-1724	B-744 *	A47-1Meg-Z*	Q13-137 *	U53 *	Volume, 50K Stop
B	Shaft			AK-3	FS-3	Not Req.	Not Req.	
C	Switch			KB-2	SWE-20	76-2	US-27	

* Connect 50K resistor in series with right hand terminal, viewed from front of control, terminals down.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SONORA PART No.	IRC PART No.	NOTES
R2	100K		N-1778	BTS-100K	
R3	10K		N-4895	BTS-10K	
R4	2.2Meg		N-4277	BTS-2.2Meg	
R5	10Meg		N-1263	BTS-10Meg	
R6	470Ω		N-4066	BTS-470	
R7	27Ω		N-6792	BTS-27	
R8	390Ω		N-5159	BTS-390	
R9	470Ω		N-4066	BTS-470	
R10	150Ω		N-3663	BTS-150	
R11	270Ω		N-4121	BTS-270	
R12	2230Ω	7	R-1762		
R13	3300Ω		N-6718	BTS-3300	
R14	100Ω	3	R-1152	PW4-100	
R15	3.3Meg			BTS-3.3Meg	Note 1

Note 1. Not used in some versions.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SONORA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	9200Ω	3-4Ω	R-1727				24S49		

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SONORA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	3½"	PM	3-4Ω	R-1751	3A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Stick	R-1754				357 Microhenries
L2	Osc. Coil	R-1753				216 Microhenries
L3	1st. IF	R-1752				
L4	2nd. IF	R-1752				

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SONORA PART No.	REPLACEMENT DATA
K1	Det.-Audio Net.	2000MMF, 150MMF, 150MMF, 10000MMF, 5000MMF, 4.7Meg, 1Meg, 3.3Meg, 10Meg	R-1119	Aervox PA521 Centralab PC-165 Sprague DP-1

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA SONORA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.057A	N-8331	1002A	RS065Q	6S65	8J1	65	

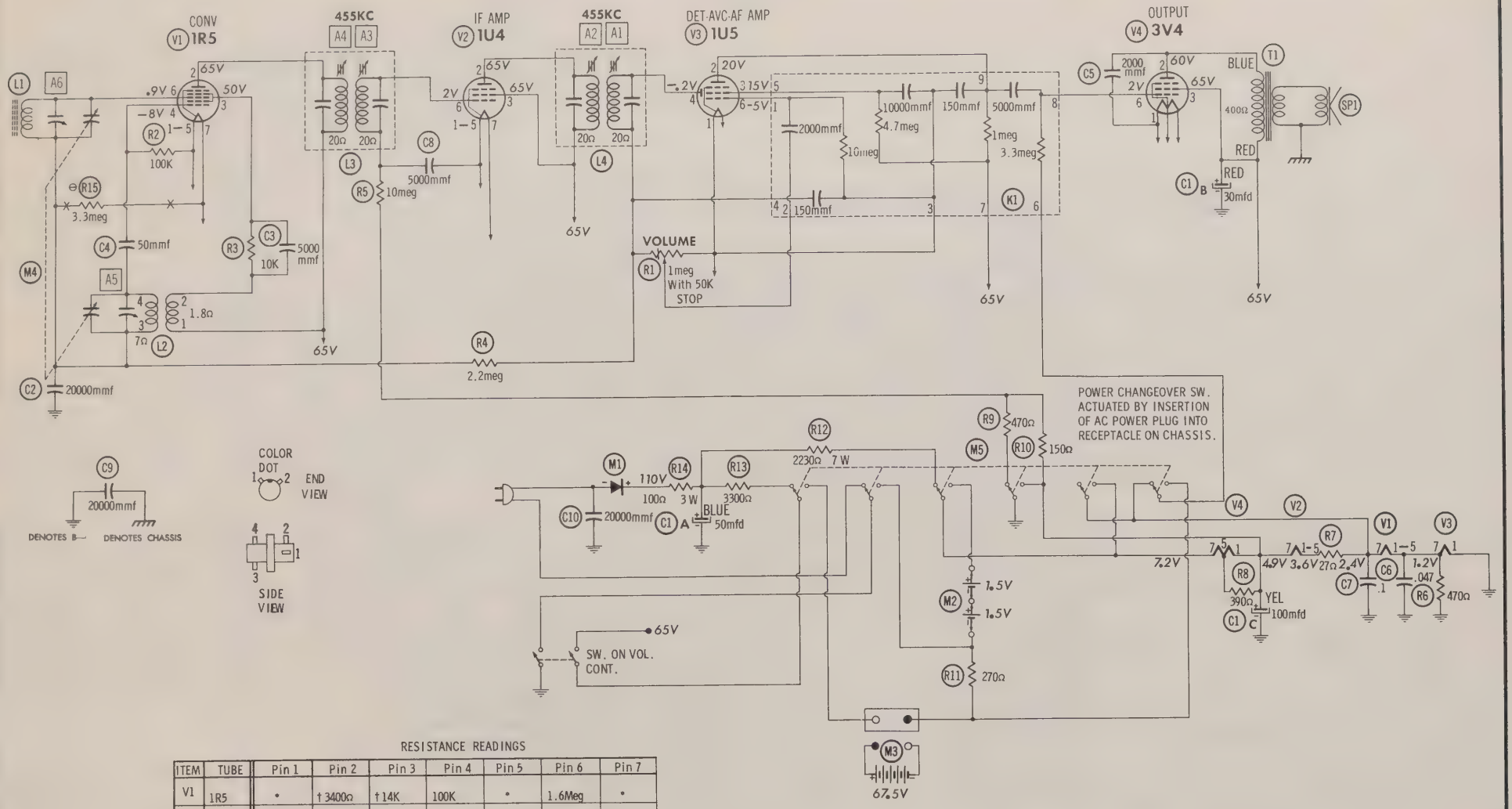
BATTERIES

ITEM No.	VOLTAGE	SONORA PART No.	REPLACEMENT DATA EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M2	1½V		950			2R			2 used in series
M3	67½V			477			P-45		

MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M4	Tuning Cap.	R-1725	Two gang (13-235MMF, 13-114MMF)
M5	Switch	R-1660	Power Change-over (Rotary, wafer type)

SONORA MODEL 607



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	•	†3400Ω	†14K	100K	•	1.6Meg	•
V2	1U4	•	†3400Ω	†3400Ω	NC	•	10Meg	•
V3	1U5	•	†1Meg	†4.7Meg	650K	NC	10Meg	•
V4	3V4	•	†3800Ω	†3400Ω	NC	•	3.3Meg	•

• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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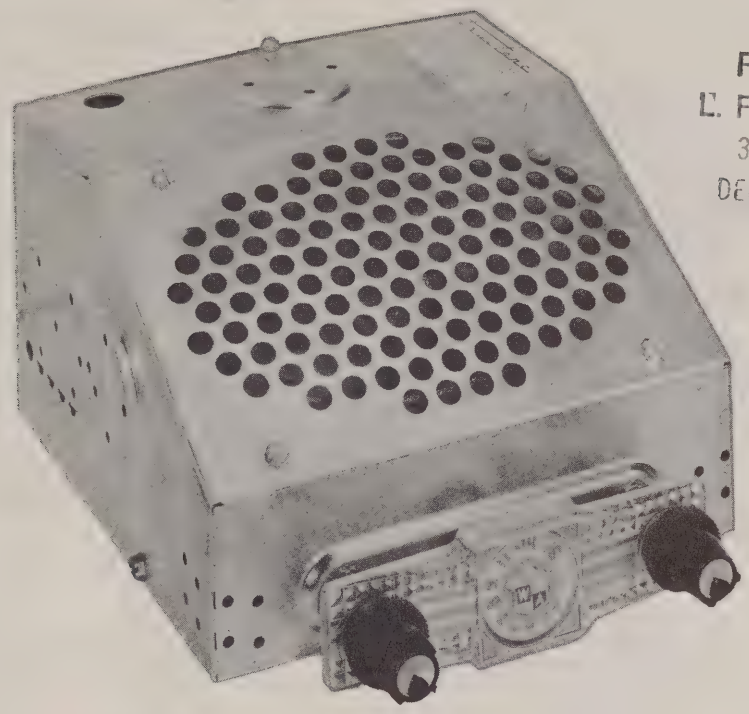
TRUETONE MODELS
D4623A, D4624A



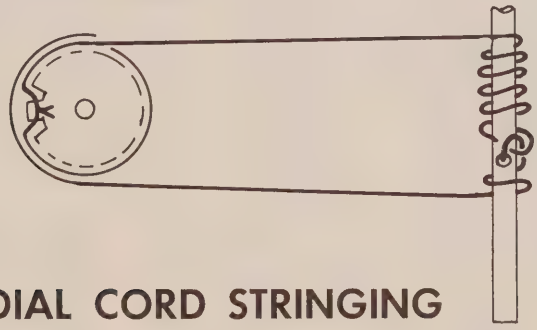
TRADE NAME	Truetone Models D4623A, D4624A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Battery Operated Universal Type AM Automobile Receiver
TUBES (Six)	Types 12BD6 RF Amplifier, 12BE6 Converter, 12BD6 IF Amplifier, 12CR6 Det-AVC-AF Amp., 12AS5 Output, 12X4 Rectifier (6 Volt Equivalent Types Used In Model D4623A)
POWER SUPPLY	6 Volt Storage Battery (Model D4623A) RATING 7.1 Amp. @ 6.3 Volts DC 12 Volt Storage Battery (Model D4624A) 3.55 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Tuner cores are preset and sealed by manufacturer; therefore core adjustment is not necessary.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.10MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	455KC (400~ Mod)	Tuning control fully counter-clockwise. (Cores out.)	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.	50MMF	High side thru dummy to antenna receptacle. Low side to chassis.	1300KC	Tune to 1300KC signal.	"	A6, A7	"

TUNING SLUGS SET AT LOWEST FREQUENCY.



DIAL CORD STRINGING

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BD6	Note 1
V2	Converter	12BE6	Note 1
V3	IF Amplifier	12BD6	Note 1
V4	Det-AVC-AF Amp.	12CR6	Note 1
V5	Output	12AS5	Note 1
V6	Rectifier	12X4	Note 1

Note 1: Equivalent 6 Volt type tube used in model D4623A.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■30	200	8C-21726	AFH3-86-50	CO630		FP318.3	T-320	TVL-3464
B	▲20	200							
C	40	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	90		8F-21949							
C3	.0047	200	8D-21819	BPD-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C4	10		8G-19502	N750-S1 10	TCN-10	TN09	N750A-100	NT-541	5TCU-Q1	
C5	.047	200	8D-21823	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C6	47		8G-12198	N750-S147	TCN-47	TN14	N750K-470	NT-5447	5TCU-Q47	
C7	220	500	8N1-233	1464-00022	TCZ-220	22R5T22			MS-322	
C8	.022	200	8D-21822	BPD-02	DF-203	CUB4S22	817-02	PT4122	2TM-S22	
C9	.01	200	8D-21820	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C10	.047	200	8D-21823	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C11	.0022	200	8D-21818	BPD-0022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C12	.01	400	8D-21828	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C13	20000		8G-23344	BPD-02	DD-203	K085	817-02	PT412	5HK-S2	
C14	.01	1000	8D-21836	P1088N-01	DD16-103	CUB16S1		PT1611	10TM-S1	
C15	.5	100	8D-24956	VHC36		ST-2P5		RF480	68P20	Note 1
C16	.5	100	8D-19810	VHC36		ST-2P5		RF480	68P20	
C17	.5	100	8D-19810	VHC36		ST-2P5		RF480	68P20	
C18	1000		8G-22721							

Note 1: Not used in model D4623A.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	1/2	10A-26697	F1-51	RTV-592C	♦QJ-1030A	UF16L	Tone (Panel) - Note 1
B	500K			R2-45			UR55-T254	Volume (Rear) Tap ② 150K
C	Switch			KB-4			US-26	

Note 1: Part no. 9B1-78 used in model D4623A.
♦ Concentrikit Equivalent, Kit K-6, Base Elements and Shafts, B11-137, P13-118 (Panel)
B13-133X, R1-130 (Rear)
76-1 Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

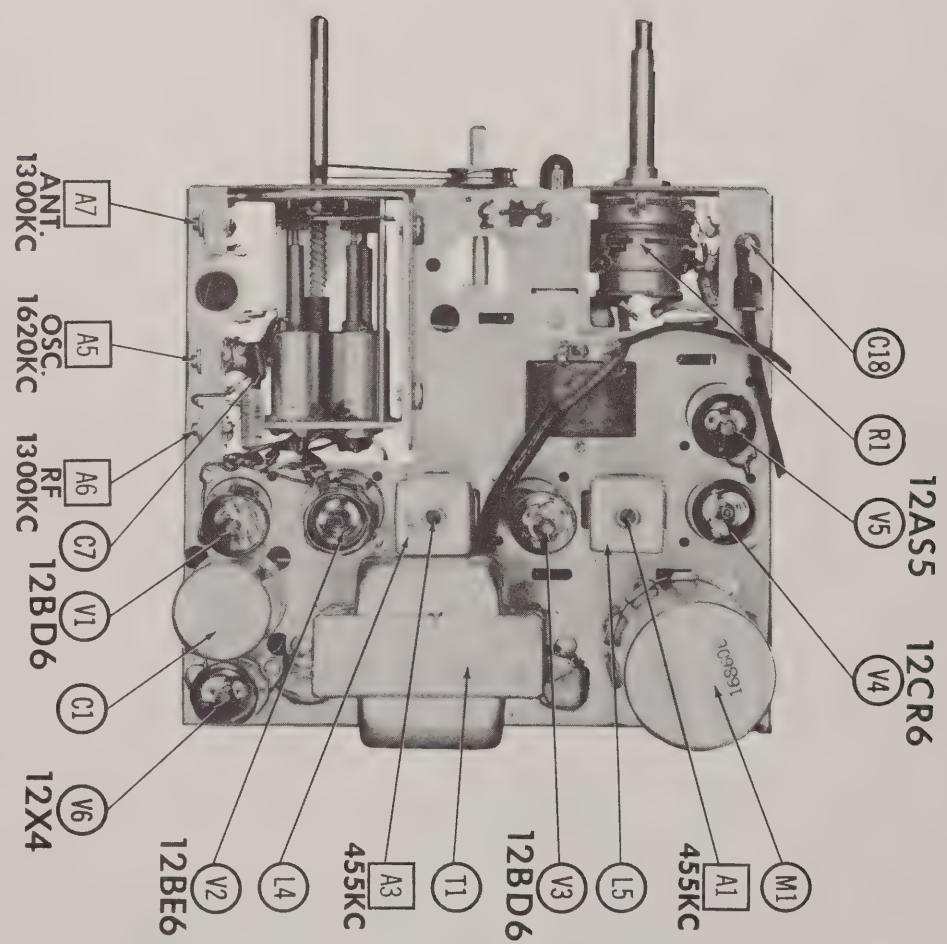
ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	NOTES
R2	1Meg		9B1-98	BTS-1Meg	
R3	220Ω		9B1-54	BTS-220	
R4	1Meg		9B1-98	BTS-1Meg	
R5	1Meg		9B1-98	BTS-1Meg	
R6	47K		9B1-82	BTS-47K	
R7	220Ω		9B1-54	BTS-220	
R8	22K		9B1-78	BTS-22K	
R9	2.2Meg		9B1-102	BTS-2.2Meg	
R10	1Meg		9B1-98	BTS-1Meg	
R11	220Ω		9B1-54	BTS-220	
R12	1200Ω	2	9B4-63	BTB-1200	
R13	4700Ω		9B1-70	BTS-4700	
R14	150Ω	1	9B2-52	BTA-150	Note 1
R15	150Ω	1	9B2-52	BTA-150	Note 1

Note 1: In model D4623A a 56Ω resistor is used in this application. (Part #9B1-47).

TRANSFORMER (VIBRATOR)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6V ② 2.08A	380VCT ② .072A			12A-26735					

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4600Ω	3-4Ω	12C-21731						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	
SP1	4" X 6"	PM	3-4Ω	18A-26778	46A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil					Note 1
L2	RF Coil					Note 1
L3	Osc. Coil					Note 1
L4	Input IF	13B-17731	16-6758	BC-352	12-C1	
L5	Output IF	13B-17731	16-6758	BC-353	12-C2	
L6	RF Choke	20I-22128	19-3500		6138	473 Microhenries
L7	Fil. Choke	16M-19921				Note 2
L8	Vib. Hash Choke	16M-19921				Note 2

Note 1: Complete assembly part #13F-21922-1.
Note 2: Part no. 16M-24001 used in model D4623A.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA	
K1	Diode RF Filter	100MMF, 100MMF, 47K	20I-15005	Aerovox	PA-97-1
				Centralab	PC-50
				Cornell-Dubilier	111TM1
				Erie	1403-01
				Sprague	D-1
K2	Audio Coupling Net.	10000MMF, 250MMF, 500K, 250K	17A-26694	Aerovox	PA-112-4
				Centralab	PC-81
				Cornell-Dubilier	113TM2
				Erie	1404-02
				Sprague	T-2

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				TRUETONE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6V	115∿	21B-24952	6301	G859	6301	Model D4624A
	Interrupter	6V	115∿	21B-23296	5301	859	5301	Model D4623A

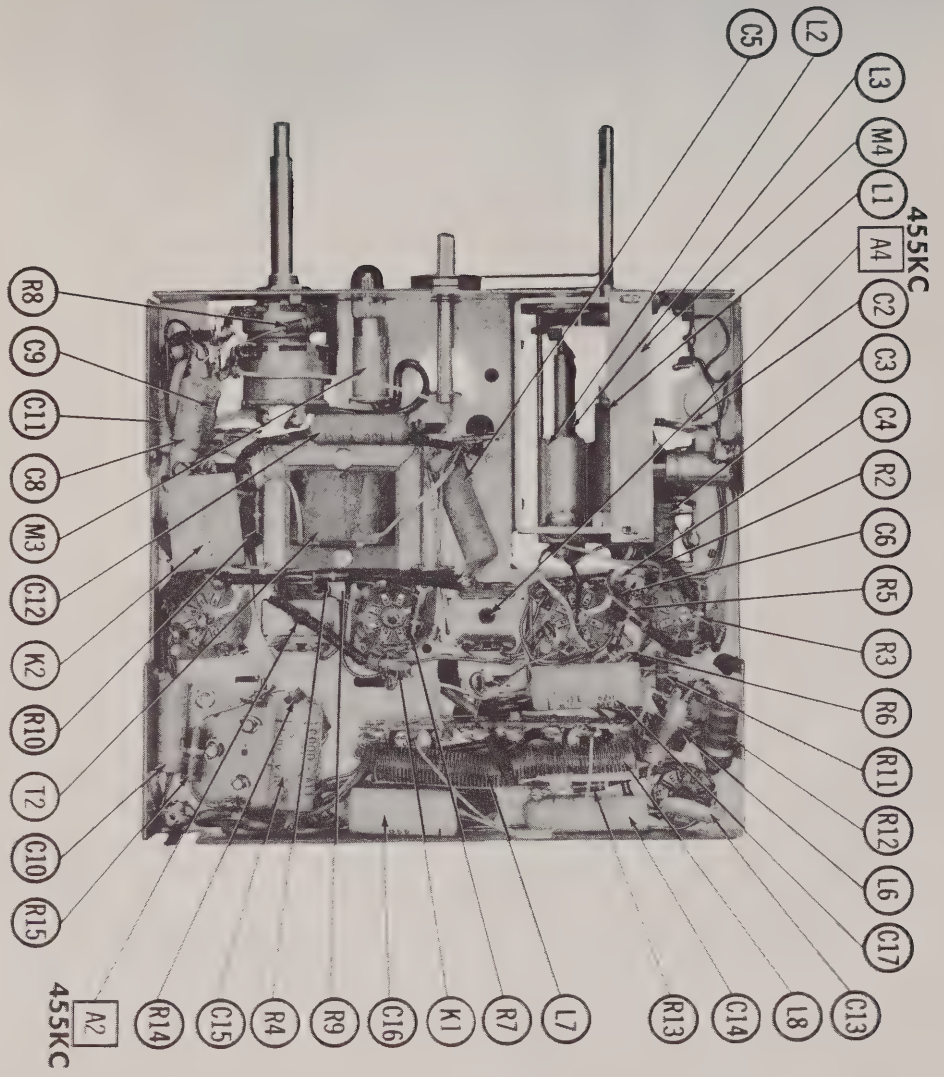
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			TRUETONE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	46B-17993		307014. (SFE-14A)	155014	SFE 14	HRI

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Dial Light	46A-22534	#1815. Model D4624A.
	Dial Light	46A-11739	#44. Model D4623A.
M4	Tuner	13F-21922-1	Permeability (Complete). Includes L1, L2 & L3.
A5	Trimmer Cap.	8E-21728	Osc.
A6	Trimmer Cap.	8E-21728	RF
A7	Trimmer Cap.	8E-21728	Ant.
	Knob	200-26723	On-Off-Volume
	Knob	200-26724	Tuning
	Knob	5B-26700-A93	Tone
	Dial Scale	5M-21796-A118	

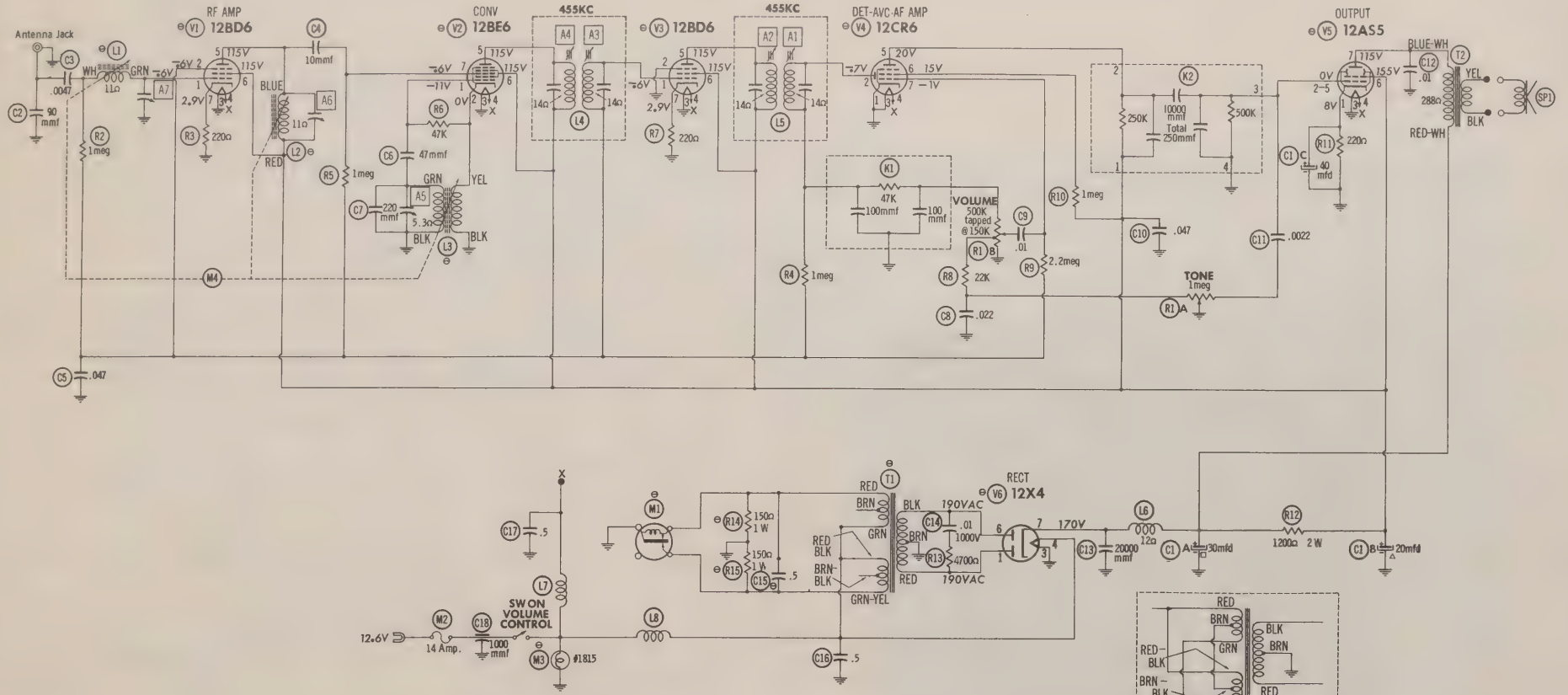
CHASSIS—BOTTOM VIEW



SET 350 FOLDER 16

TRUETONE MODEL D4623A

TRUETONE MODEL D4623A



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BD6	2.5Meg	1.5Meg	0Ω	1Ω	†1200Ω	†1200Ω	220Ω
V2	12BE6	47K	.5Ω	0Ω	1Ω	†1200Ω	†1200Ω	2.5Meg
V3	12BD6	1.5Meg	0Ω	0Ω	1Ω	†1200Ω	†1200Ω	220Ω
V4	12CR6	0Ω	550K	0Ω	1Ω	†250K	†1Meg	3.7Meg
V5	12AS5	220Ω	500K	0Ω	1Ω	500K	†1200Ω	†300Ω
V6	12X4	200Ω	NC	0Ω	1Ω	NC	180Ω	50K

† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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RETMA MEMBER

WESTINGHOUSE CHASSIS V-2344, V-2345, V-2354, V-2355

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WESTINGHOUSE MODEL H-21T107 (Ch. V-2344-26)

TRADE NAME	Westinghouse	MODELS	CHASSIS
		H-21T101, H-21T104, H-21T105, H-21T106, H-21T107, H-21T108, H-21K111, H-21K112, H-21K113, H-21K114, H-21K115, H-21K116	V-2344-25, -26
		H-24T117, H-24T118, H-24T119, H-24T120, H-24T121, H-24K122, H-24K125, H-24K126, H-24K127, H-24K128	V-2345-26
		H-21TU101, H-21TU104, H-21TU105, H-21TU106, H-21TU107, H-21TU108, H-21KU111, H-21KU112, H-21KU113, H-21KU114, H-21KU115, H-21KU116	V-2354-204
		H-24TU117, H-24TU118, H-24TU119, H-24TU120, H-24TU121, H-24KU122, H-24KU125, H-24KU126, H-24KU127, H-24KU128	V-2355-204
MANUFACTURER	Westinghouse Electric Corp., Television & Radio Division, Metuchen, N. J.		
TYPE SET	Television Receiver		
TUBES	Sixteen		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 160 Watts 1.46 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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WESTINGHOUSE CHASSIS
V-2344, V-2345, V-2354, V-2355

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WESTINGHOUSE CHASSIS
V-2344, V-2345, V-2354, V-2355

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs.
2. Remove 3 metal screws, remove rear cover.
3. Remove 6 chassis hold-down bolts.
4. Remove 8 metal screws holding top and lower left corner braces.
5. Remove 1 metal screw holding antenna terminal board.
6. Remove 2 metal screws holding volume control bracket.
7. Remove 2 speaker leads.
8. Remove 2 speaker nuts and speaker.
9. If shipping braces are still in set, remove 2 hex nuts, remove braces, and remove "C" washer from tuner shaft, do not re-install.
10. Remove chassis.

MODEL	CHASSIS
H-21T107	V-2344-26

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of VHF tuner oscillator, it is necessary to remove the chassis from the cabinet. (See disassembly instructions.)

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

SPECIAL ADJUSTMENTS

A. Sync Control Adjustment

The sync control is set at the factory for a strong signal area (normal or fully clockwise position).

If the receiver is to be used in a weak or noisy signal area, adjust as follows: Tune in a station and adjust the vertical and horizontal hold controls for best stability of the picture. Turn the sync control (R6) slowly counter clockwise until maximum sync stability is obtained. Do not turn any farther than is necessary for best stability. Check the stability by switching to all stations operating in the area.

CAUTION: If the sync control is turned too far counter clockwise, it will result in clipping of the sync information and cause sync instability.

B. Focus Adjustment

Adjust Ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Tune in a TV station and set the horizontal hold control at mid-range. Adjust the horizontal frequency slug (B2) until the picture synchronizes horizontally. (To adjust the horizontal frequency slug, it is necessary to remove the rear cover and supply power to the set.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust quieting control for MINIMUM buzz and best sound quality.

FUSES

A 7.5Ω fusible resistor (R94) is used for LV power supply protection.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

WESTINGHOUSE CHASSIS
V-2344, V-2345, V-2354, V-2355

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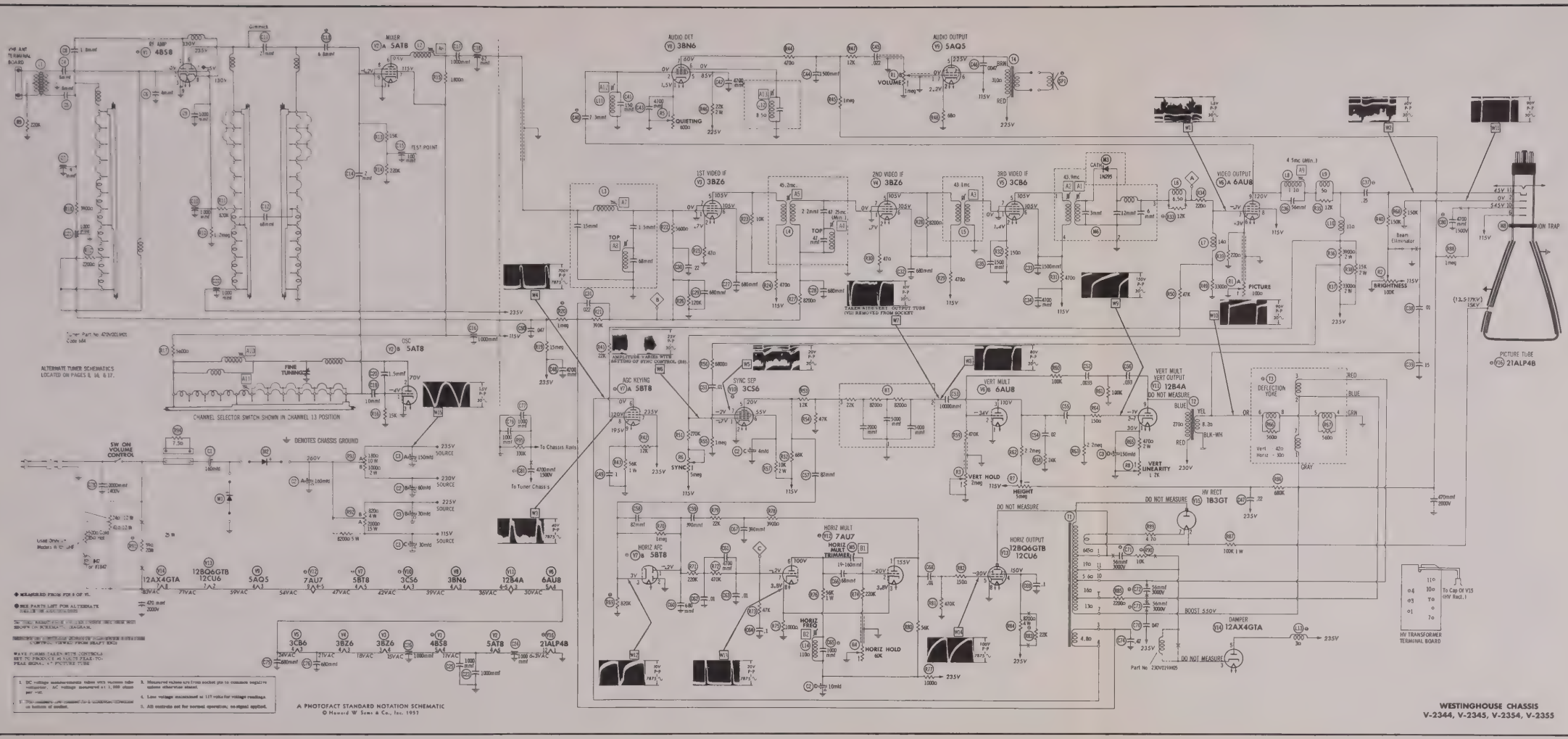

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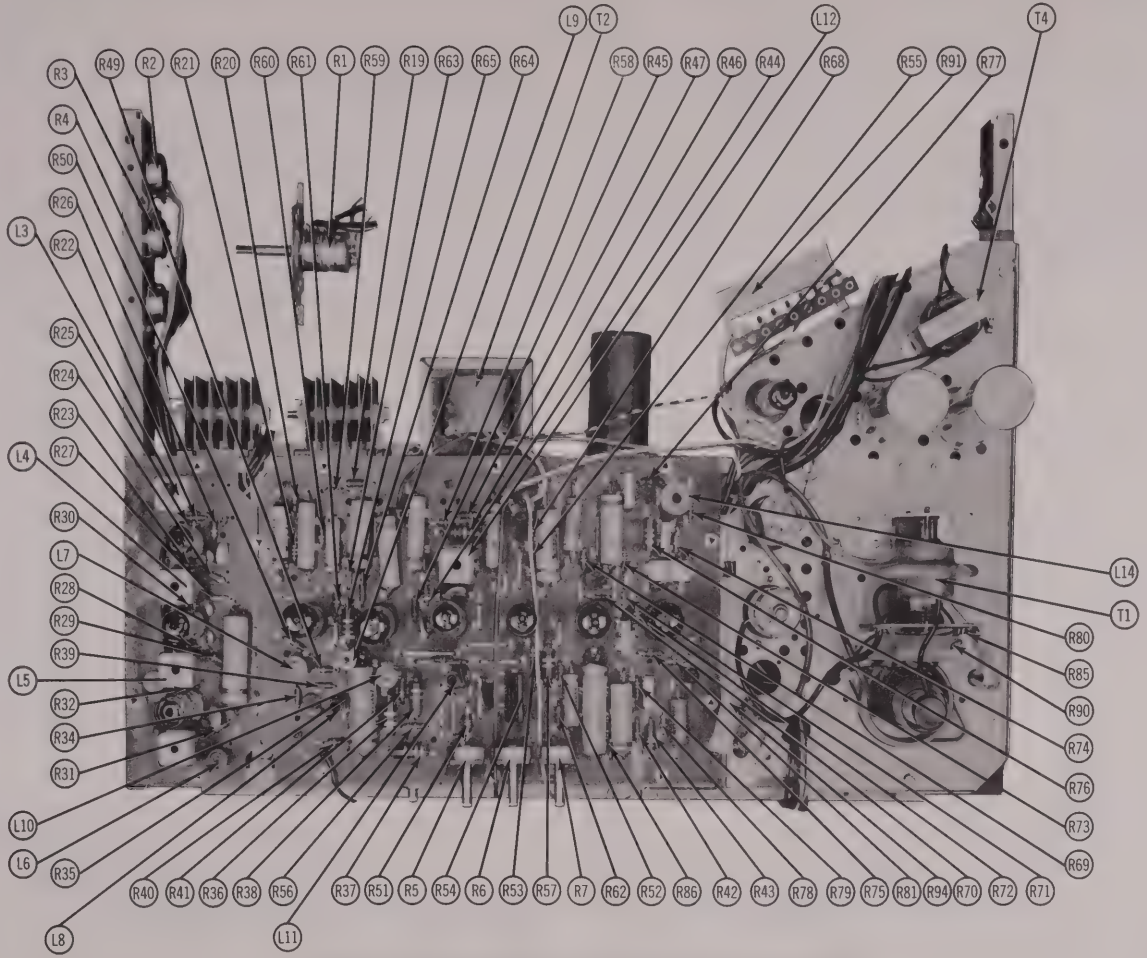
WESTINGHOUSE CHASSIS
V-2344, V-2345, V-2354, V-2355



CHASSIS TOP VIEW RESISTOR & INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART

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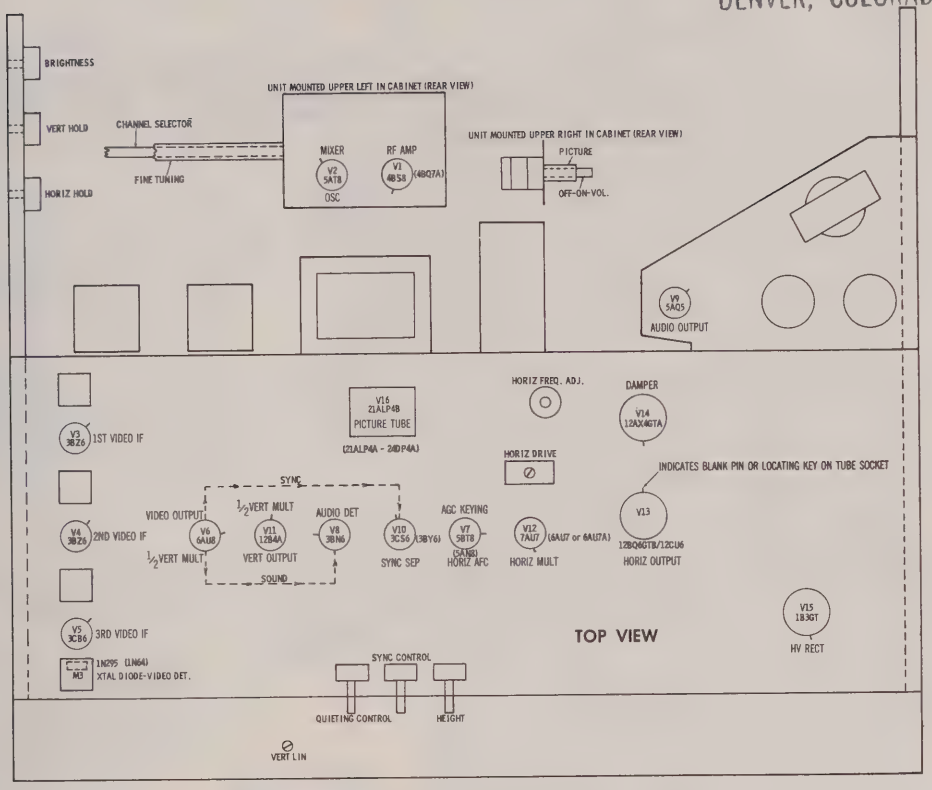


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

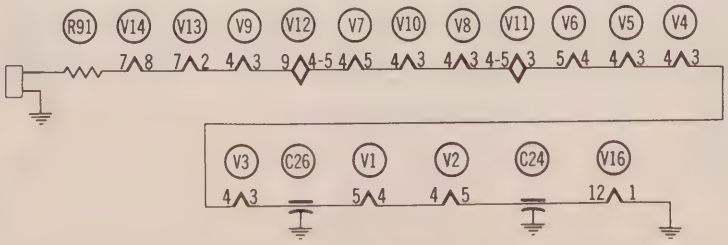
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R94), Selenium Rect. (M1, M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, Diode (M3), V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V16**
Has pic, no sound - **V8, V9**
Overloaded picture - **V7**

SYNC FAILURE
No vert. sync - **V10, V6, V11**
No horiz. sync - **V10, V7, V12**
No vert. or horiz. sync - **V10**

SWEEP FAILURE
No raster, has sound - **V7, V12, V13, V14, V15, V16**
No vertical deflection - **V6, V11**
Poor vert. linearity or foldover - **V6, V11**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, M1, M2**
Vert. off freq. - **V10, V6, V11**
Horiz. off freq. - **V10, V7, V12**

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative (See circuit below).



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓑ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of V3. Low side to chassis.	Not used	43.9MC (Unmod)	Any unused channel	USE VTVM. DC probe to point Ⓐ . Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	"	"	"	43.1MC	"	"	A3	"
3.	"	"	"	47.25MC	"	"	A4	Adjust for MINIMUM deflection.
4.	"	"	"	45.2MC	"	"	A5	Adjust for maximum deflection.
5.	"	"	44MC	41.25MC 42.25MC 43.0MC 45.0MC 45.75MC	"	Vert. Amp. thru 47K to point Ⓐ . Low side to chassis. Connect 470MMF across scope input terminal.		Check for waveform similar to Fig. 1. Adjust A2 for correct tilt if necessary. The low frequency side of curve is corrected by retouching A3. The high frequency side is adjusted by A5.
6.	Fig. 2	Across antenna terminals thru matching network (Fig. 2).	213MC (10MC Swp)	215.75MC 214.0MC 213.0MC 212.0MC 211.25MC	13	"	A6, A7, A8	Adjust for response curve as shown in Fig. 3. Adjust A6 for maximum amplitude and A7 for proper tilt. Adjust A8 to place 215.75MC marker in trap notch as shown in Fig. 3. If A6 and A7 are properly adjusted the markers will be positioned as shown in Fig. 3.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	FM GENERATOR COUPLING	FM GENERATOR FREQUENCY	AM GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.001MFD	High side to pin 7 (grid) of 6AU8 (V6). Low side to chassis.	4.5MC (15KC Swp)	Not used	Any unused channel	Vert. Amp. to top side of volume control. Low side to chassis.	A12	Using lowest signal level that will produce an indication on scope. Adjust A13 for maximum indication on scope.
8.	"	"	"	"	"	"	A13	Using a strong generator output, adjust A13 for maximum on scope.
9.	"	"	Not used	4.5MC (400∿ AM 30% Mod.)	"	"	R5	Begin with a very low signal level and increase signal while rotating the quieting control (R5) back and forth until the signal level is such that the indication on the scope dips to zero with a rise on either side as R5 is rotated. Set R5 for zero indication on the scope at this signal level.

ALTERNATE SOUND IF ALIGNMENT USING TV SIGNAL AND OSCILLOSCOPE

Connect an adjustable attenuator between the antenna and the receiver antenna terminals. Tune in a local TV station. Set the quieting control (R5) at mid-range.
Adjust A12 for maximum program sound. If peaks occur at two different settings of the slug, use the position with the slug farthest counter clockwise. Adjust the attenuator for the lowest usable signal level and recheck to adjustment of A12.
Set the attenuator for the strongest signal and adjust A13 for maximum program sound. If peaks appear at two positions of the slug, use the one with the slug farthest counter clockwise.
If two peaks appear within a narrow range of adjustment, the signal applied is not strong enough or the quieting control is not set at the desired position.
Reduce the signal input until a noise can be heard in the sound and adjust the quieting control (R5) for MINIMUM noise. The position at which the noise is minimized depends on the strength of the signal being applied to the antenna terminals, therefore the weakest station in the area should be used. Do not leave the quieting control set at its maximum counter clockwise position.

4.5MC TRAP ALIGNMENT

The RF probe should contain a blocking capacitor.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001MFD	High side to point Ⓐ . Low side to chassis.	4.5MC (Unmod)	Any unused channel	DC probe thru RF probe to pin 11 (cathode) of picture tube. Common to chassis.	A9	Adjust A9 for MINIMUM deflection on VTVM.

OSCILLATOR ALIGNMENT

Turn the channel selector to the highest high band channel operating in the area and set the fine tuning to mid-position (flat side of fine tuning shaft at one o'clock.)
Using a non-metallic alignment tool adjust A10 for best picture detail and sound quality.
Leaving the fine tuning at mid-range, change the channel selector to the highest low band (2-6) operating in the area and adjust A11 for best picture detail and sound quality. Recheck the adjustment of A10 for the highest high band channel and retouch if necessary.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

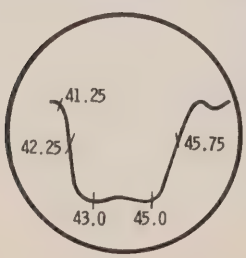
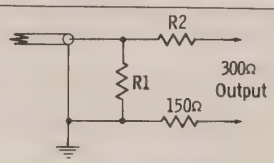


FIG. 1



Z_0 = Impedance of Sweep Cable

Z_0	R1	R2
50Ω	56Ω	120Ω
72Ω	82Ω	110Ω

FIG. 2

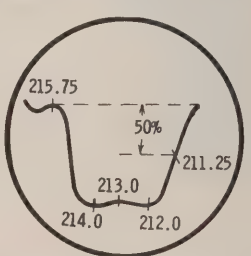
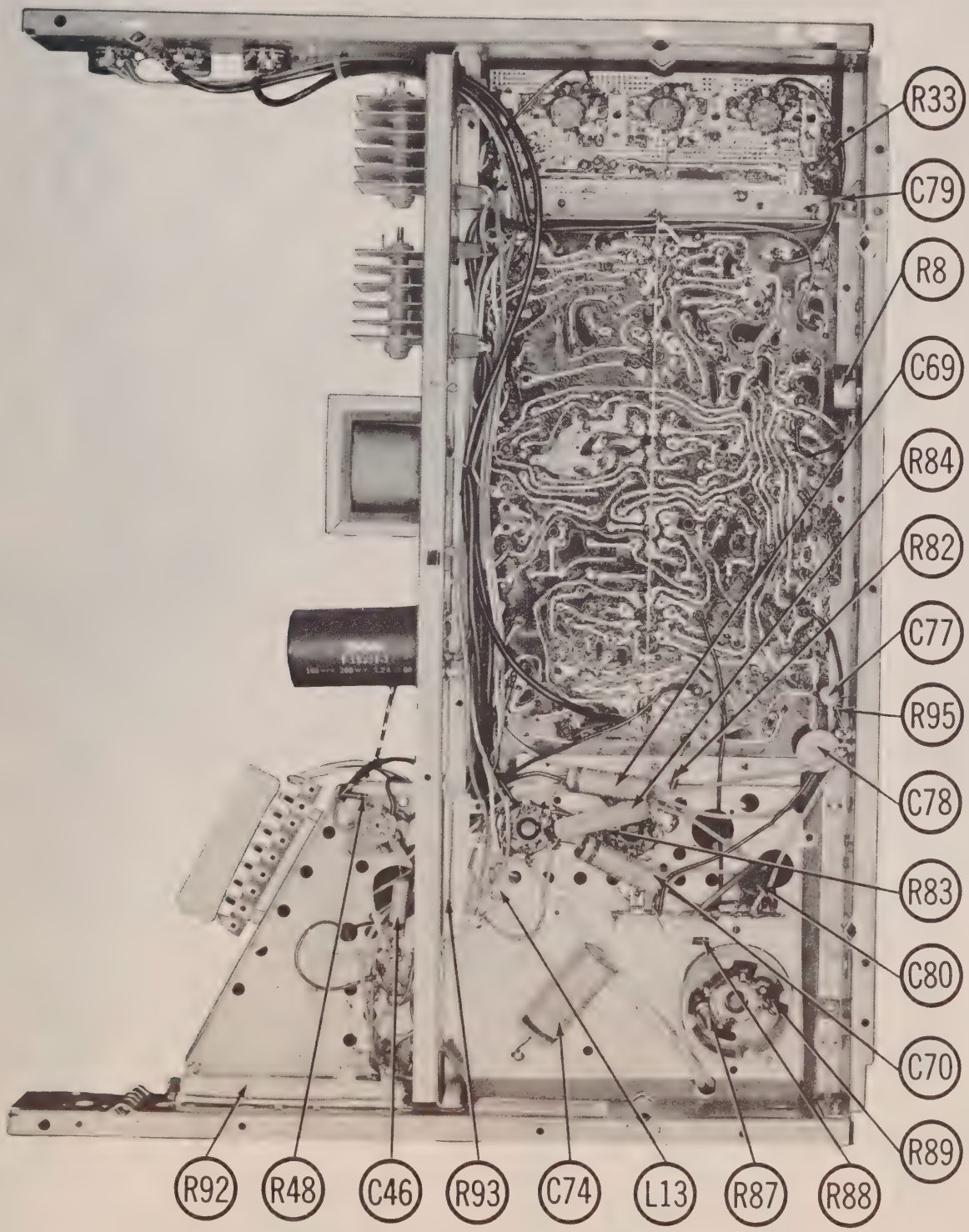
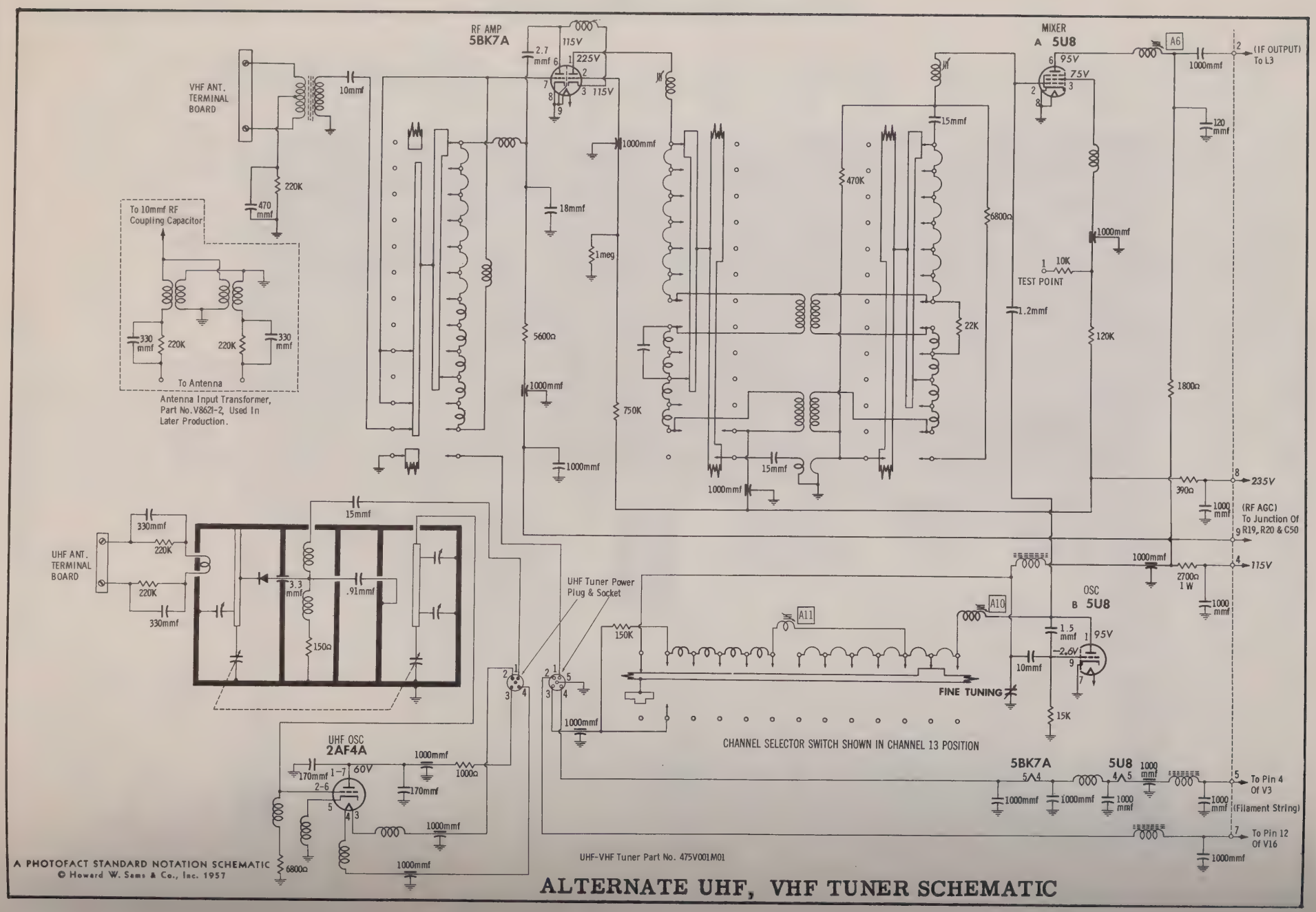


FIG. 3



CHASSIS BOTTOM VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE UHF, VHF TUNER SCHEMATIC

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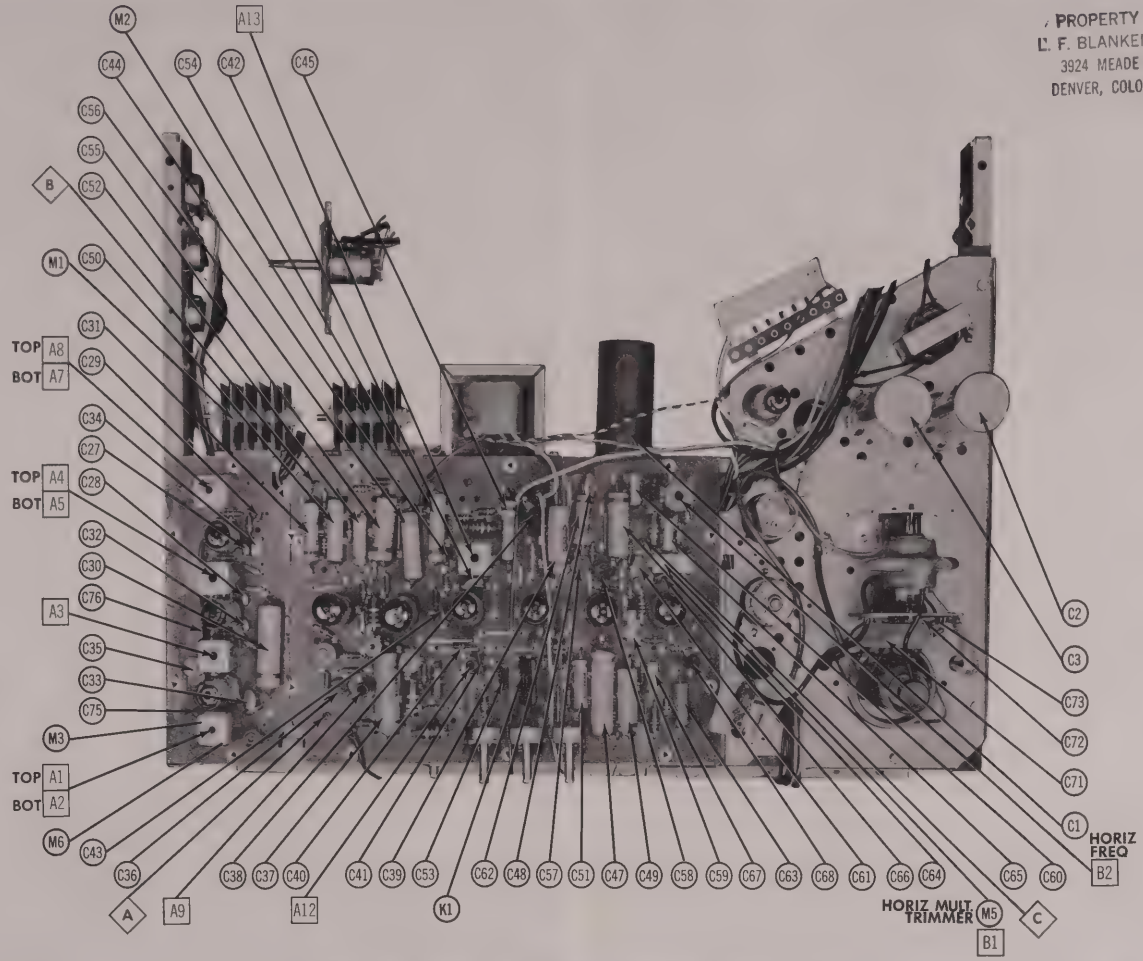
3924 MEADE St.
DENVER, COLORADO



CHASSIS TOP VIEW CAPACITOR & ALIGNMENT IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BS8	INF	1.3Meg	0Ω	2Ω	3Ω	†180Ω	470K	INF	0Ω
V2	5AT8	15K	†7500Ω	0Ω	2Ω	1Ω	†3800Ω	†2000Ω	0Ω	235K
V3	3BZ6	110K	47Ω	4Ω	3Ω	†2500Ω	†2500Ω	0Ω		
V4	3BZ6	110K	47Ω	4Ω	5Ω	†2500Ω	†2500Ω	0Ω		
V5	3CB6	.1Ω	150Ω	5Ω	6Ω	†2500	†2500Ω	0Ω		
V6	6AU8	0Ω	● 1.3Meg	● †5Meg	7Ω	6Ω	5Ω	3300Ω	†2000Ω	†4800Ω
V7	5BT8	1.8Meg	0Ω	820K	11Ω	10Ω	460K	†180Ω	†27K	22K
V8	3BN6	●150Ω	.4Ω	8Ω	9Ω	†22K	8.5Ω	‡1Meg		
V9	5AQ5	●700K	68Ω	12Ω	13Ω	†1200Ω	†2000Ω	●700K		
V10	3CS6	50K	0Ω	9Ω	10Ω	†35K	†12K	1Meg		
V11	12B4A	● 1000Ω	2.2Meg	7Ω	8Ω	8Ω	NC	2.2Meg	NC	†1300Ω
V12	7AU7	†57K	● 250K	1000Ω	11Ω	11Ω	†57K	2.5Meg	1000Ω	12Ω
V13	12BQ6GTB 12CU6	NC	13Ω	NC	†5600Ω	470K	NC	15Ω	0Ω	TOP CAP ‡19Ω
V14	12AX4GTA	TP	NC	4Meg	NC	180Ω	NC	17Ω	15Ω	
V15	1B3GT		PINS	1 THRU 8	HAVE	INF	RESISTANCE			TOP CAP ‡664Ω
V16	21ALP4B	0Ω	150K	PIN 6 †2000Ω	PIN 10 ‡1Meg	PIN 11 ●160K	PIN 12 1Ω			

† MEASURED FROM OUTPUT OF M2.
‡ MEASURED FROM PIN 3 OF V14.
TP TIE POINT.
NC NO CONNECTION.
● THIS READING WILL VARY WITH SETTING OF CONTROL. CONTROL SET FOR NORMAL OPERATION.

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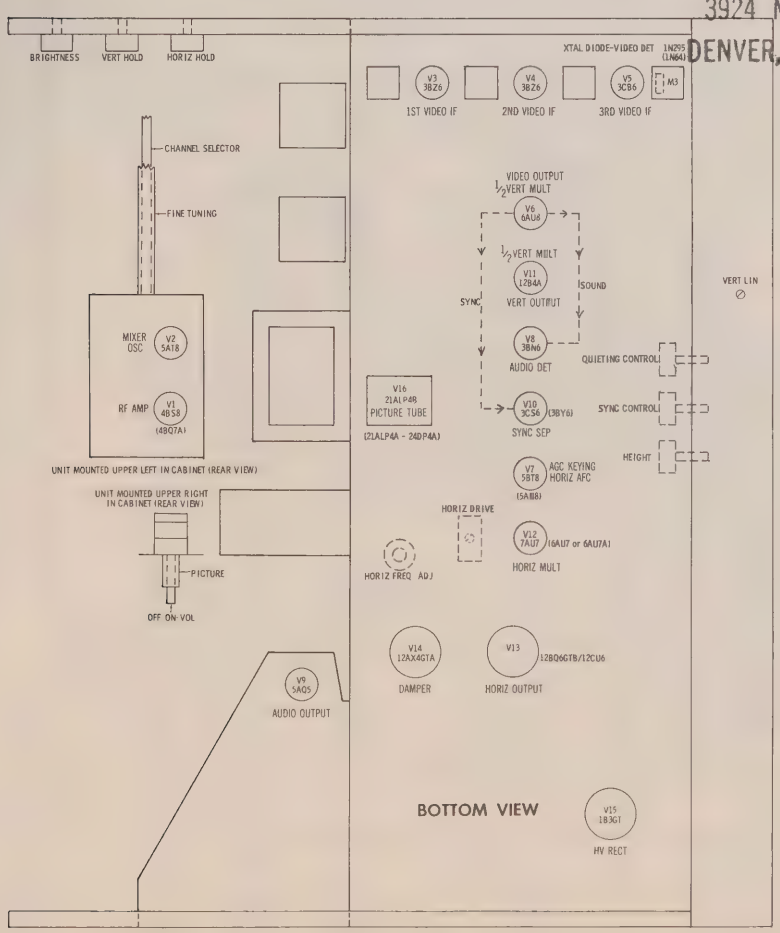
3924 MEADE ST.
DENVER, COLORADO



TUBE PLACEMENT CHART

SET 350 FOLDER 17

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	4BS8	Note 1
V2	Mixer-Oscillator	5AT8	
V3	1st Video IF Amplifier	3BZ6	
V4	2nd Video IF Amplifier	3BZ6	
V5	3rd Video IF Amplifier	3CB6	
V6	Video Output Vert Multi	6AU8	
V7	AGC Keying Horiz AFC	5BT8	Note 2
V8	Audio Detector	1N5GT	
V9	Audio Output	8AQ8	
V10	Sync Separator	3CB6	Note 3
V11	Vert. Mult. -Vert. Output	12BA6	
V12	Horiz Mult	7AU7	Note 4
V13	Horiz. Output	12BQ6GTB	
V14	Damper	12AX6GTA	
V15	HV Rectifier	1B3GT	

Note 1 6BQ7A may be used in some versions
Note 2 5AN8 may be used in some versions
Note 3 5U16 may be used in some versions.
Note 4 6AU8 or 6AU7A may be used in some versions.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	Westinghouse PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V16	21AL4P4B	21AL4P4B	21AL4P4A ①	21AL4PA4/ B	① Aluminized ② Silver Screen 65"
	21AL4P4A	21AL4P4	21AL4P4	21AL4PA4 ②	
	24DP4A	24DP4A ②	24DP4A ②	24DP4	
				24TP4 ②	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA					
	CAP	VOLT	Westinghouse PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No	TYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No
C1	180	300	V-15329-1	AFH3L-37-3S	XAG266	FP12L	TME-34	S-180	TVL-1473
C2A	180	350	V-15844-1	AFH3L4-56-3S		FP419.65			TVL-4606.5
B	480	300							
C	4	300							
D	10	300							
C3A	150	300	V-15885-1	AFH4-46-3S		FP419.37			TVL-4574
B	30	300						Q-230	
C	30	300						MTD-6530	
D	150	50							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	①									
C5	①									
C6	①									
C7	①									
C8	1. 8			BPD-001	DD-102	BYA8DH	ED-1000		58K-DH	
C9	1000			RP-001	MPT-1000				503C-DU	
C10	27				TCZ-R68					
C11	68				TCZ-R68	C10V68C	TCC0-6.8	ST-5668	5TCC5-V68	Note 1
C12	6. 8			HPG-62 6.8		C10V3C				
C13	③									
C14	250									
C15	1000			RP-001	MPT-1000					
C16	1000			BPD-001	DD-102	BYA8DH	ED-1000	DC8DH	58K-DH	
C17	1. 8			HPG-62 10	TCZ-10	C10Q1C	TCC0-10	ST-5611	5TCC-Q1	
C18	1. 8			HPG-62 1. 5	TCZ-1R5			ST-5515	5TCC5-V15	
C19	1000			RP-001	MPT-1000				503C-DU	
C20	1000			RP-001	MPT-1000				503C-DU	
C21	1000			BPD-001	DD-102	BYA8DH	ED-1000	DC8DH	58K-DH	
C22	1000			RP-001	MPT-1000				503C-DU	
C23	680		21SV18A8H	BPD-00068	DD-681	BYA10DH68-680		UC-5368	5GA-T68	
C24	680		21SV18A8H	BPD-00068	DD-681	BYA10DH68-680		UC-5368	5GA-T68	
C25	680		21SV18A8H	BPD-00068	DD-681	BYA10DH68-680		UC-5368	5GA-T68	
C26	33	400	21SV13A34	P-6434-33		CUB4P33		GEM-6033	4TM-P33	
C27	.033	600	21SV06A33	BPD-03	DF-303	CUB6D33		GEM-6133	6TM-S33	
C28	680		21SV18A8H	BPD-00068	DD-681	BYA10DH68-680		UC-5368	5GA-T68	
C29	1500		V-10710-13	BPD-0015	DD-152	BYA10DH15-1500		DC5D15	58K-D15	
C30	4700		21SV20M04	BPD-00472	DD-472	BYA10DH47-4700		DC-5347	58K-D47	
C31	1500		V-10710-13	BPD-0015	DD-152	BYA10DH15-1500		DC5D15	58K-D15	
C32	1000		21SV18A8G							
C33	.35	600	V-15457-2	P-6435-35		CUB4P35		GEM-6035	4TM-P35	Note 2
C34	.01	600	21SV10M03			BC8EJ	ED-01	ACE3D1	68K-S10	
C35	.15	400	21SV11A54	P-6436-15		CUB4P15		GEM-6015	4TM-P15	Note 3
C36	7. 5									
C40	180		21SV11A81							
C43	4700		21SV30M04	BPD-0047	DD-473	BYA10DH47GP-4700		UC-5347	58K-D47	
C45	4700		21SV30M04	BPD-0047	DD-473	BYA10DH47GP-4700		UC-5347	58K-D47	
C46	1500		21SV10A58	BPD-0015	DD-152	BYA10DH15-1500		DC5D15	58K-D15	
C48	.033	600	21SV06A33	BPD-03	DF-303	CUB6D33		GEM-6133	6TM-S33	
C49	.0047	600	21SV06A23	BPD-0047	DF-473	CUB6D47 GP-4700		GEM-6147	6TM-D47	
C47	33	400	21SV11A34	P-6436-33		CUB4P33		GEM-6033	4TM-P33	
C48	4700		21SV30M04	BPD-0047	DD-473	BYA10DH47GP-4700		UC-5347	58K-D47	
C49	.1	400	21SV01A54	P-6436-1	DF-104	CUB4P1		GEM-601	4TM-P1	
C50	.047	600	21SV06A73	BPD-06	DF-503	CUB6E47		GEM-6147	6TM-S47	
C51	.01	600	21SV06A10	BPD-01	DD-103	CUB6E1	ED-01	GEM-6110	6TM-S1	
C52	.0033	600	21SV06M03	BPD-0025	DE-332	CUB6D33 GP-3300		GEM-6333	6TM-D33	
C53	10000			BPD-001	DD-103	BYA8E1	ED-01		58K-S1	
C54	.03	600	V-15897-3	BPD-03	DF-303	CUB6E3	ED-03	GEM-6130	6TM-S3	
C55	.1	400	21SV01A54	P-6436-1	DF-104	CUB4P1		GEM-601	4TM-P1	
C56	.033	600	21SV06A33	BPD-03	DF-308	CUB6E33		GEM-6133	6TM-S33	
C57	82		21SV18A30							
C58	82		21SV18A30							
C59	390		21SV13M91	1468-00039		5WS739			MS-339	
C60	390		21SV13M81	1467-00038		5WS738			MS-338	
C61	4700		21SV30M04	BPD-0047	DD-473	BYA10DH47GP-4700		UC-5347	58K-D47	
C62	.01	600	21SV06A10	BPD-01	DD-103	CUB6E1	ED-01	GEM-611	6TM-S1	
C63	.01	600	21SV06A10	BPD-01	DD-103	CUB6E1	ED-01	GEM-611	6TM-S1	
C64	.1	400	21SV01A54	P-6436-1	DF-104	CUB4P1		GEM-601	4TM-P1	
C65	1000		21SV13M03	1467-002		5WS12	ED-1000	MC3E5	MS-31	Note 4
C66	68		21SV15A80							
C67	390		21SV13M91	1468-00039		5WS739			MS-339	
C68	.01	600	21SV10M03			BC8EJ	ED-01	ACE3D1	68K-S10	
C69	.1	400	21SV01A54	P-6436-1	DF-104	CUB4P1		GEM-601	4TM-P1	

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C70	.047	600	21SV06A47	P-6436-47		CUB4P47		GEM-6147	6TM-S47	
C71	56	3000	21SV15A56	BPD-00068	DD-681	BYA10DH68-680		UC-5368	5GA-T68	Note 5
C72	56	3000	21SV15A81	BPD-00068	DD-681	BYA10DH68-680		UC-5368	5GA-T68	Note 5
C73	56	3000	21SV15A81	BPD-00068	DD-681	BYA10DH68-680		UC-5368	5GA-T68	Note 5
C74	47	400	21SV01A47	P-6436-47		CUB4P47		GEM-6047	4TM-P47	
C75	680		21SV18A8H	BPD-00068	DD-681	BYA10DH68-680		UC-5368	5GA-T68	
C76	680		21SV18A8H	BPD-00068	DD-681	BYA10DH68-680		UC-5368	5GA-T68	
C77	1000	1400	21SV30M03	BYD-15-1000	DD18-103	BYH1DH1	1B5KV-103	DC3D31	20HK-D1	
C78	10000		21SV30M13	BYA8E1	DD-103	BYA8DH	ED-1000	DC5D	58K-S1	
C79	1000	1400	21SV30M03	BYD-15-1000	DD18-103	BYH1DH1	1B5KV-103	DC3D31	20HK-D1	
C80	4700	1500	21SV30M01	BYD-15-4700		BYH1DH47			20HK-D6	Note 5
C81	4700	1500	21SV30M01	BYD-15-4700		BYH1DH47			20HK-D6	Note 5

Note 1. Some versions use a 10MMF in this application.
Note 2. Some versions use a .1MFD @ 400V (Part #21SV01A54)in this application.
Note 3. Some versions use a 6. 8MMF (Part #V-6963-6898) in this application.
Note 4. Later production uses part #21SV13M03.
Note 5. Not used in some versions.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	100Ω	①	27SV0023M01				UE-76Ω	Picture Volume
B	1Meg	①					Not Req.	
C	Switch						Not Req.	
R2A	100K	①	27SV0023M03	B-40	A47-100K-8	QU-138	U-6	Brightness
B	Shaft			Not Req.	F8-3	Not Req.	Not Req.	
R3A	2Meg	①	27SV0023M04	B-75	A47-2Meg-8	QU-139	U56	Horiz. Hold
B	Shaft			Not Req.	F8-3	Not Req.	Not Req.	
R4A	50K	①	27SV0023M02	B-25	A47-75K-8	QU-125	U-35	
B	Shaft			Not Req.	F8-3	Not Req.	Not Req.	Quieting
R5	500Ω	①	27SV001M01					Sync
R6	5Meg	①	27SV001M13					Height
R7	3Meg	①	27SV001M02					Vert. Lin.
R8	1000Ω	3/4	V14763-3	A101			WF-152	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	NOTES
R9	220K		35SV232A24	BTS-220K	
R10	1. 2Meg			BTS-1. 2Meg	Note 1
R11	820K			BTS-820K	
R12	220Ω		35SV232A23	BTS-220	
R13	15K		35SV232A53	BTS-15K	
R14	220K		35SV232A24	BTS-220K	
R15	1800Ω		35SV232A18	BTS-1800	
R16	15K		35SV232A53	BTS-15K	
R17	5600Ω		V-8927-33	BTS-5600	
R18	3900Ω		35SV232A93	BTS-3900	
R19	15Meg 5%		35SV31A56		
R20	1Meg 5%		35SV31A06		Note 1
R21	560Ω		35SV232A64		
R22	5600Ω		V-8927-33		
R23	10K		V-8927-10		
R24	470Ω		35SV23A47	BTS-470	
R25	47Ω		35SV23A70	BTS-47	
R26	130K		35SV232A44		
R27	3900Ω		V-8927-33	BTS-3900	
R28	8200Ω		V-8927-35		
R29	470Ω		35SV23A47	BTS-470	
R30	47Ω		35SV23A70	BTS-47	
R31	470Ω		35SV23A47	BTS-470	
R32	150Ω		35SV23A51	BTS-150	
R33	15K		35SV23A53		Note 2
R34	220Ω		35SV23A23		
R35	15K		35SV23A53	BTS-15K	
R36	3300Ω	2	35SV432A33		
R37	3300Ω	2	35SV432A33		
R38	15K	2	35SV432A53		
R39	220Ω		35SV23A22	BTS-220	
R40	150K		35SV23A54	BTS-150K	
R41	33K		35SV23A33	BTS-33K	
R42	12K		35SV21A53	BTS-12K	
R43	68K 5%		35SV31A63	BTA-68K 5%	
R44	470Ω		35SV23A71	BTS-470	
R45	1Meg		35SV21A06	BTS-1Meg	
R46	33K	2	35SV432A33	BTS-33K	
R47	12K 5%		35SV23A53	BTS-12K 5%	
R48	68Ω 5%		35SV21A80	BTS-68	
R49	3300Ω		35SV23A33	BTS-3300	
R50	47K		35SV23A73	BTS-47K	
R51	270K		35SV221A74	BTS-270K	
R52	68K		35SV23A83	BTS-68K	
R53	12K		35SV22A53	BTS-12K	

ITEM No.	RATING		REPLACEMENT DATA		
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	NOTES
R54	47K		35SV224A73	BTS-47K	
R55	1Meg		35SV21A06	BTS-1Meg	
R56	6800Ω		35SV23A82	BTS-6800	
R57	10K	2	35SV432A03	BTS-10K	
R58	24K 5%		35SV21A43	BTS-24K 5%	
R59	470K		35SV23A74	BTS-470K	
R60	100K		35SV23A04	BTS-100K	
R61	100K		35SV23A04	BTS-100K	
R62	1. 2Meg		35SV23A35	BTS-1. 2Meg	
R63	3. 3Meg		35SV223A26	BTS-3. 3Meg	
R64	1500		35SV23A15	BTS-150	
R65	4700	2	35SV434A71	BTS-470	
R66	5600Ω		35SV23A82		
R67	560Ω		35SV23A81		
R68	150K		35SV31A54	BTS-150K	
R69	820K				Note 3
R70	1Meg		35SV23A06		
R71	220K		35SV23A24	BTS-220K	
R72	470K		35SV23A74		
R73	47K		35SV23A73		
R74	220K		35SV232A24	BTS-220K	
R75	1000Ω		35SV23A02		
R76	56K	1	35SV23A63		
R77	1000		35SV23A02		
R78	5900Ω		35SV23A74	BTS-470K	
R79	22K		35SV232A23		
R80	56K		35SV23A63		
R81	470K		35SV23A74	BTS-470K	
R82	150Ω		35SV23A51	BTS-150	
R83	33K		35SV232A33	BTS-33K	Note 2
R84	82000	4	V-12171-1	PW4-8200	
R85	2200Ω		35SV23A22	BTS-2200	
R86	680K		21SV136A84	BTS-680K	
R87	100K	1	V-8927-10	BTA-100K	
R88	1Meg		35SV21A06	BTS-1Meg	
R89	4. 7Ω		21SV004A79	BW1-4. 7	
R90	10K		35SV23A03	BTS-10K	Note 2
R91	99Ω	25	25SV01M91		Note 6
R92A	2000Ω	10	35SV05M03	2)DA-2000	
B	830Ω	4			
R93A	180Ω	10	35SV05M04		
B	1000Ω	3			
R94	7. 5Ω		25SV02M01	FR7. 5	
R95	330K		35SV232A34	BTS-330K	

Note 1. A 1. 5Meg (Part #35SV21A55) is used in some versions.
Note 2. Not used in some versions.
Note 3. A 680K (Part #35SV23A36) is used in some versions.
Note 4. Some versions use part #35SV15M02 in Ch. V-2344 and V-2345.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							NOTES
		Westinghouse PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	Horiz. Output Trans.	42SV001M01	FB41① =②	HVO-54 ① = ②		X13T ① = ②	A-3285① = ②	FLY-76 ① = ②	D-42① = ②
T2	Vert. Output Trans.	43SV005M01	22900 ①	A-2833		V30S ①	A-8443	26G72	A-10KX
T3	Yoke (90°) Horiz. (30MH)	48SV003M01	DF80①	MDF-92	325DH ③	Y90F1/43 ③	DY-32A ③	Y-16 ③	T-4① ④
B	Vert. (9MH)	78SV007M01 ③	DF80① ②	MDF-92 ②	325DH ③	Y90F1/43 ③ ④	DY-32A ③ ④	Y-16 ③ ④	T-4① ④

① This part may be superceded by Parts Manufacturer's introduction of special unit for this application.
② Drill new mounting holes.
③ Use 8 to 1 turns ratio.
④ Alternate Westinghouse part number.
⑤ Use original yoke rear cover and centering device.
⑥ Use original horiz. yoke damping network.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	1	9	5		2	5	5	5
	11	7	4		1	4	4	6
	10	7	5		4	5	4	6
	T	NC	NC		NC	NC	NC	NC
	7	1	1		7	1	1	1
	3	2	8		8	8	8	4
	4	6	7		6	7	7	3
Special Notes		E-7	D7-8		D7	D7	D7	D-7

① Change value of C72 to approximately 100MMF.
② Install capacitor C78 and resistor R86 across horizontal yoke terminals #3 and #7.
Remove capacitors C71, C73 and resistor R90.
③ Disconnect ground lead from terminal #8.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Westinghouse PART No	Halldorson PART No	Merit PART No	Stancor PART No.	Thordarson PART No.	Triad PART No.
T4	7600Ω	3-4Ω	V-9238-3	ZJJ13	A-3931	A-3978	25G48	S-7X

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C IMP	Westinghouse PART No.	OJAM PART No	
SP1	5"	PM	3-4Ω	V-15597-1 ①	5A07	① Used in Models H-21T07, H-21TU07, H-24T12, H-24TU12, H-24T12S, H-24TU12S, H-24T17, H-24TU17
	6"	PM	3-4Ω	V-15599-1 ②	6A1	② Used in Models H-21K13, H-21KU13, H-21K13S, H-21KU13, H-21K16, H-21KU16
	8"	PM	3-4Ω	V-14438-1 ③	8A13	③ Used in Models H-24K136, H-24KU136, H-24K137, H-24KU137, H-24K138, H-24KU138
						④ Used in Models H-21K15, H-21KU15, H-21K18, H-21KU18

COILS (RF-IF)

ITEM No.	USE	Westinghouse PART No.	NOTES
L1	Ant. Coil	V-19024	

ITEM No.	USE	Westinghouse PART No.	NOTES
L3	Mixer Plate Coil	V-19034-8	

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L3	1st. Video IF	23SV00M03				Includes 6. 8MMC trap and cage.
L4	2nd. Video IF	V-15884-1				Includes 47. 3MMC trap and cage.
L5	3rd. Video IF	V-15885-1	17-6004	TV-126	6324	
L6	Series Peaking Coil	V-15795-1	19-3100	TV-1	6131	100 Microhenries
L7	Shunt Peaking Coil	V-15796-8	19-1933			250 Microhenries
L8	4. 5MC Trap	V-15796-1				
L9	Series Peaking Coil	V-15796-7	19-3250	TV-126	6131	330 Microhenries
L10	Shunt Peaking Coil	V-15796-5	19-3300		6156	390 Microhenries
L11	1st. Sound IF	V-15795-2				
L12	Quadrature Coil	V-15790-1				
L13	RF Choke	V-8089-3	19-1003			5. 9 Microhenries, IRC part #C1.A- Note 1

Note 1. Some versions use 14 microhenry choke Part #42UV10M08.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA						NOTES
	PRI	SEC	Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No	Ram PART No.	Thordarson PART No.	NOTES
L14	110Ω		V-15791-1							

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K1	Vert. Integrator	3000MMF, 5000MMF, 5000MMF, 33K, 330Ω, 330Ω	V-15886-1	Aerovox PA-310 Centralab PC-100 Cornell-Dubilier 15TM1 Erie 1420-01 Sprague V-1

RECTIFIERS

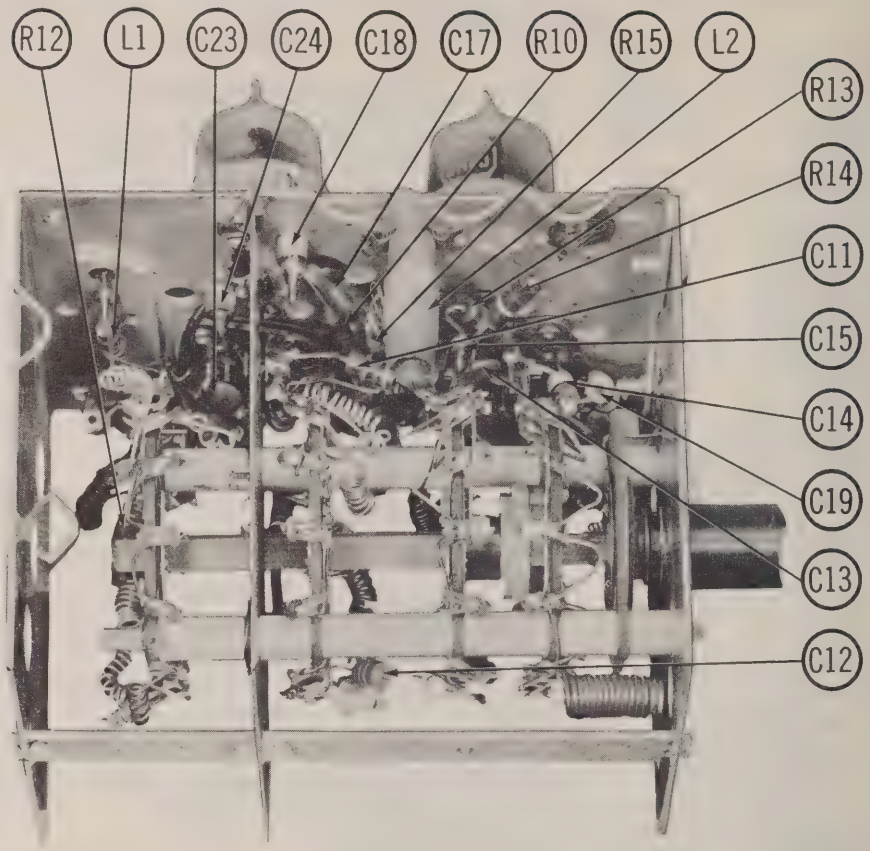
ITEM No.	RATING	REPLACEMENT DATA							
	CURRENT (Measured)	Westinghouse PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.
M1	250A	V-15920-3 ①	1367AP①	1N1007 ①	RS250B1 ①	5S250 ①	6QA3 ①	250A ①
M2	200A	V-15920-2 ①	1367AP ①	1N1007 ①	RS250B1 ①	5S250 ①	6QA3 ①	250A ①

① Selenium type. ② Germanium type.

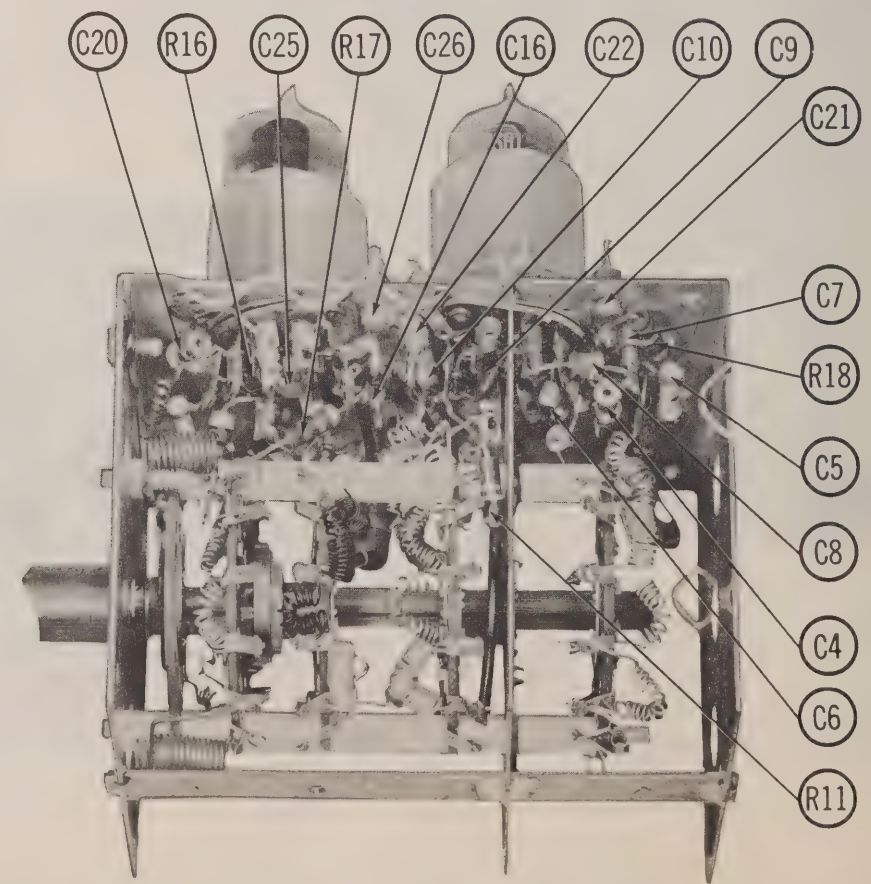
CRYSTAL DIODES

ITEM No.	ORIG TYPE	REPLACEMENT DATA		NOTES
		Westinghouse PART No.	SYLVANIA PART No.	
CR1	1N295 *		1N90	Video Detector (Pigtail)

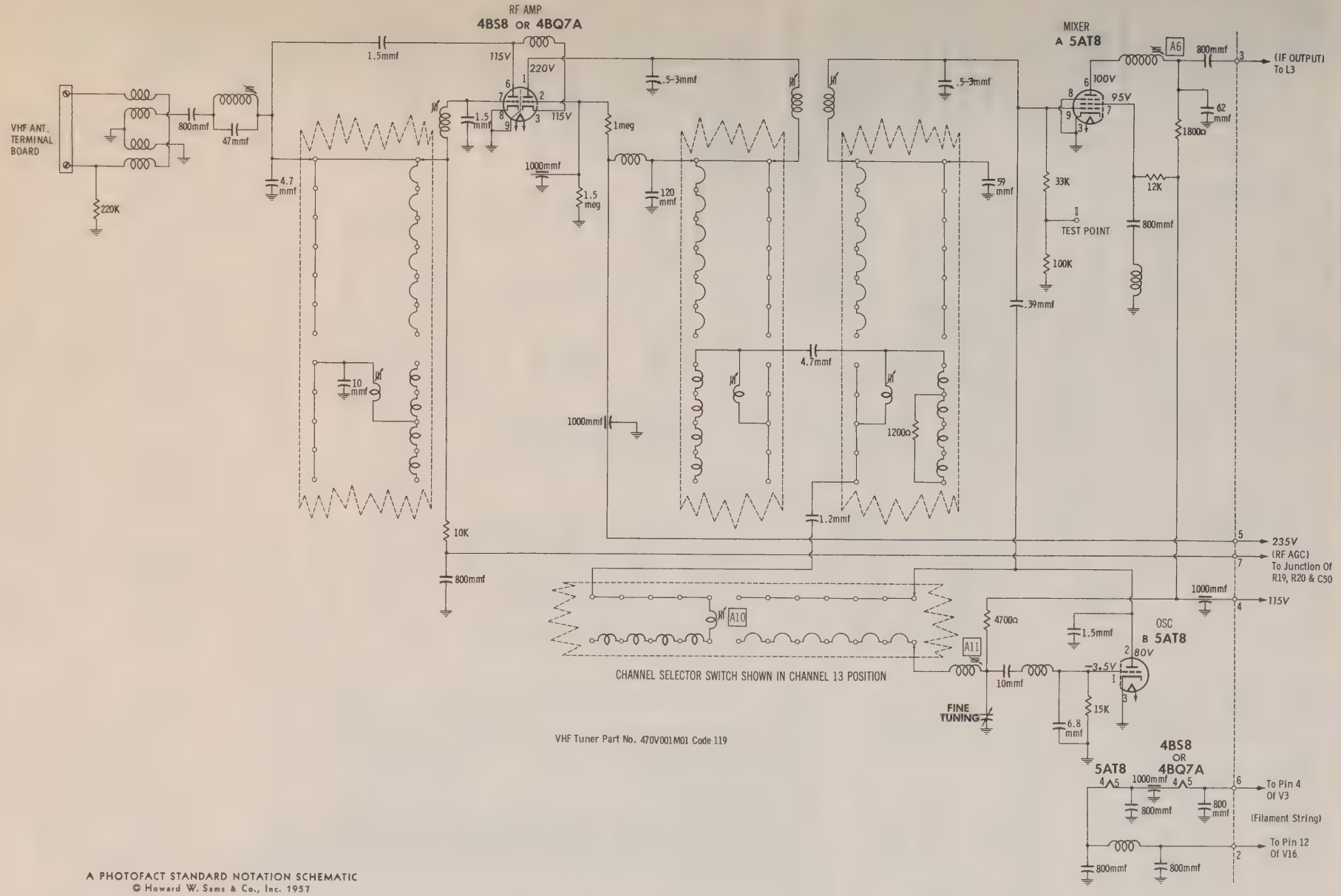
* 1N64 may be used in some versions.



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



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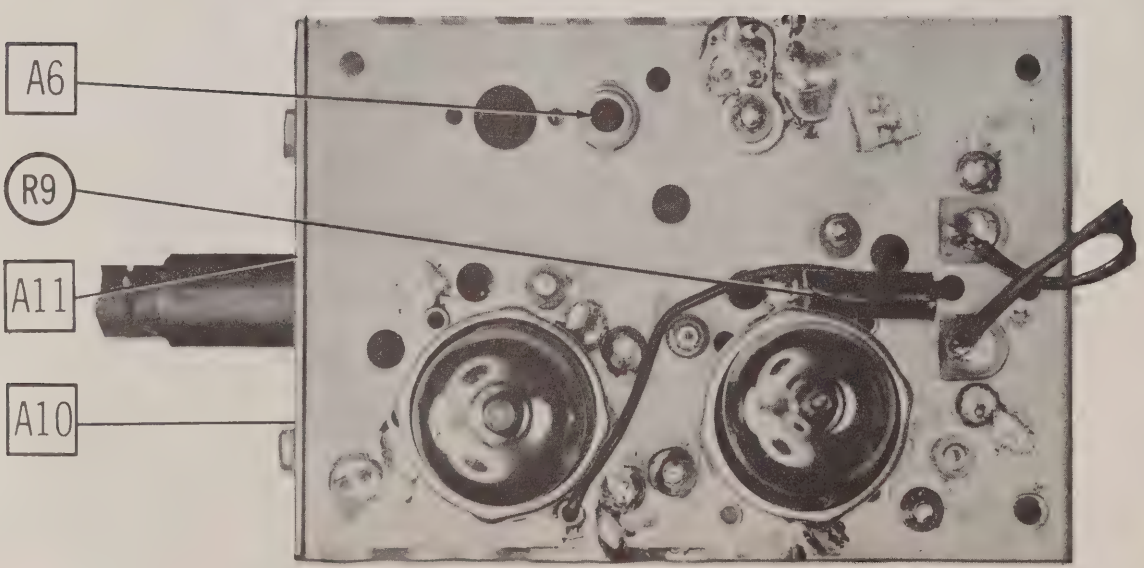
ALTERNATE VHF TUNER

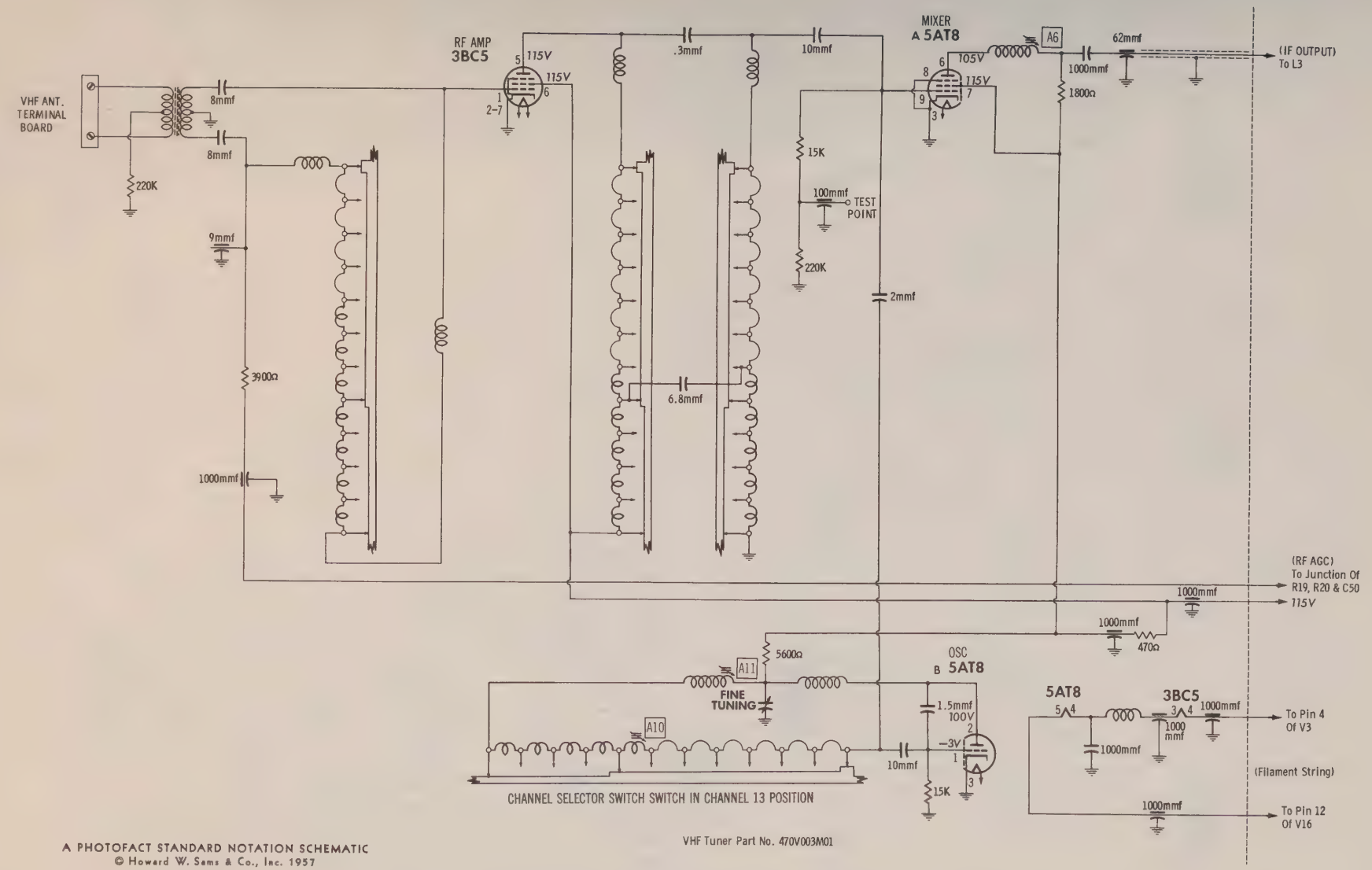
PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M4	Tuner	470V001M01	Code 119 or 684, VHF, Used in Ch. V2344-26, V-2345-26
	Tuner	470V003M01	VHF, Used in Ch. V-2344-25
	Tuner	475V001M01	UHF/VHF, Used in Ch. V-2354-204, V-2355-204, VHF tuner part #473V001M01 and UHF tuner part #474V001M01
M5	Trimmer Cap.	217V501M01	Horiz. Mult. Mica (19-160MMF)
M6	Detector Assy.	V-15686-1	Complete assy. Includes 4th. video IF, diode M3, caps and series peaking coil
M7	Centering Device	V-15996-1	Includes yoke rear cover
M8	Ion Trap	V-9784-4	
	Yoke Clamp	768V014M01	
	Printed Board	V-15722-IF	IF strip
	Printed Board	350V001M01E	Sweep and sound IF
	Safety Glass	630V002M01	Models H-21K113, 114, 115, H-21KU113, 114, 115, 116
	Safety Glass	630V001M01	Models H-21K112, H-21KU112
	Safety Glass	630V004M01	Clear - Models H-24T121, 122, H-24TU121, 122, H-24K126
	Safety Glass	630V004M01	Tinted - Models H-24K127, 128, H-24T117, H-24TU117,
	Mask	610V001M02	Models H-21K112, H-21KU112
	Mask	610V001M01	Models H-21K113, 114, 115, 116, H-21KU113, 114, 115, 116
	Mask	610V002M03	Models H-24T121, H-24K126, 127, H-24TU121, H-24KU126, 127
	Mask	610V002M02	Models H-24T112, H-24K128, H-24KU128
	Knob	550V022M01	Channel selector, Models H-21KU115, H-21KU116
	Knob	550V003M03	Channel selector, Models H-21K115, H-21K116, H-21K113, 114, H-24T121, 122, 127, 128
	Knob	550V003M05	Channel selector, Model H-21K112, H-24T117, H-24K126
	Knob	V-15813-10	Channel selector, Models H-21KU112, 113, 114, H-24TU117, H-24TU121, 122, H-24KU126, 127, 128
	Knob	550V020M01	UHF, Models H-21KU115, 116
	Knob	V-15668-1	UHF, Models H-21KU112, 113, 114, H-24TU117, 121, 122, H-24KU126, 127, 128
	Knob	V-15667-1	VHF Fine Tuning, UHF Tuning - Models H-21KU115, 116, H-21K115, 116, H-21KU112, 113, 114, H-24TU117, 121, H-24K126, 127, 128, H-24KU126, 127, 128
	Knob	V-15671-7	VHF fine tuning - Models H-21KU112, H-24TU117, H-24KU126
	Knob	V-15671-6	VHF fine tuning - Models H-21KU113, 114, H-24TU121, 122, H-24KU127, 128
	Knob	550V002M01	Brightness, Horiz., Vert. - H-21KU116, H-21K116, H-21K114, H-24T121, H-24K128
	Knob	550V002M02	Brightness, horiz. Vert. - Models H-21KU115, H-21K115, H-21K112, 113, H-24T117, H-24TU117, H-24T122, H-24K126, 127
	Knob	V-15812-6	Picture - All models
	Knob	V-15810-6	On-off-volume - Models H-21K115, 116, H-21KU115, 116, H-21KU113, 114, H-24T121, 122, H-24TU121, 122, H-24K127, 128
	Knob	V-15810-7	On-off-volume - Models H-21K112, H-21KU112, H-24T117, H-24TU117, H-24K126
	Cabinet	516V003M01	Models H-21KU115, H-21K115,
	Cabinet	516V004M02	Models H-21K116, H-21KU116
	Cabinet	510V003M02	Models H-21K112, 113
	Cabinet	510V003M03	Model H-21K114
	Cabinet	510V002M07	Models H-24T117, H-24TU117
	Cabinet	510V002M02	Model H-24T121
	Cabinet	510V002M03	Model H-24T122
	Cabinet	510V004M02	Models H-24K126, 127
	Cabinet	510V004M03	Model H-24K128



RF TUNER TOP VIEW



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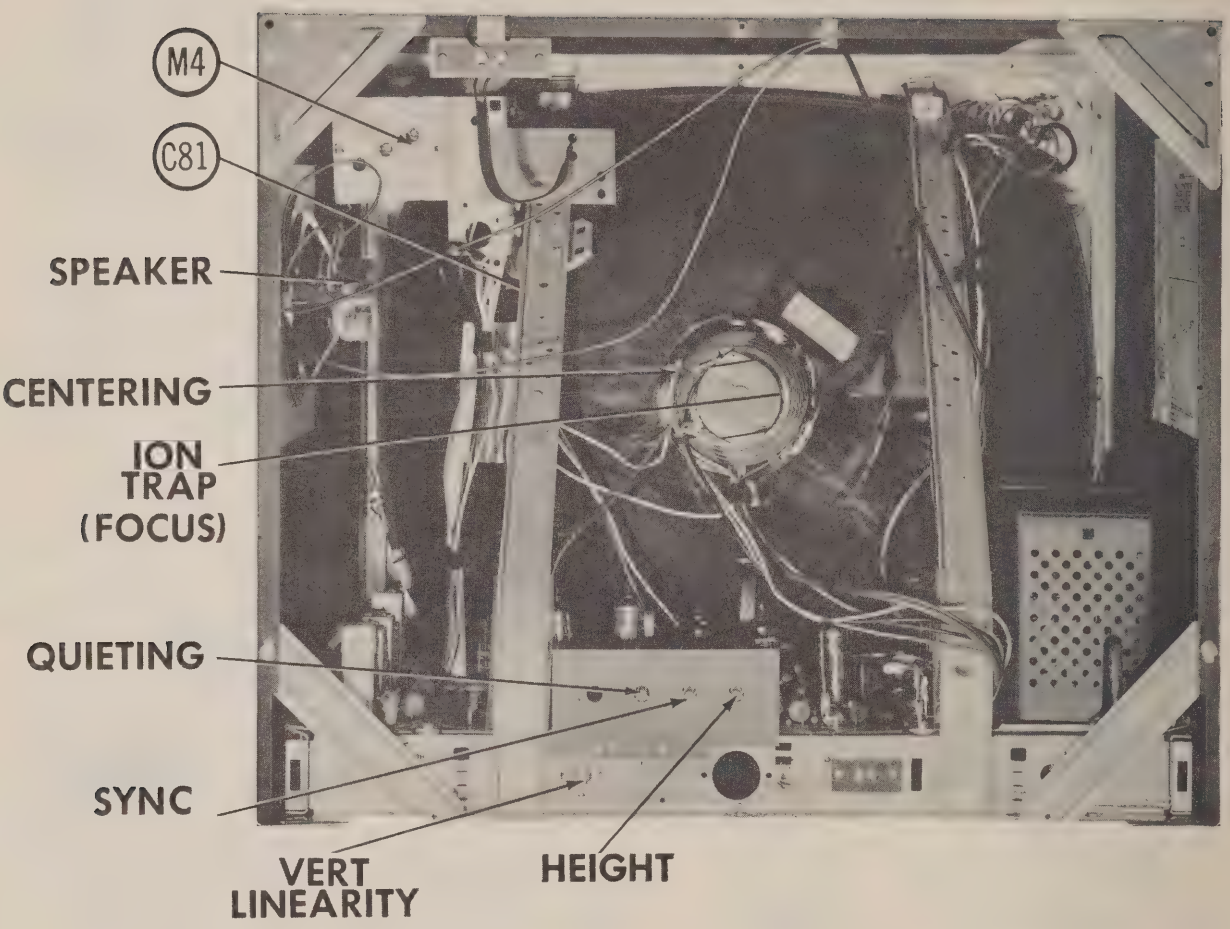
ALTERNATE VHF TUNER



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

FOR CHASSIS USING 5BT8 HORIZONTAL AFC

Turn the set on and tune in a TV station, preferably with a test pattern. Connect a clip lead across the horizontal frequency coil (L14) and set the horizontal hold control (R4) at the center of its range and leave it there during the rest of the adjustments.

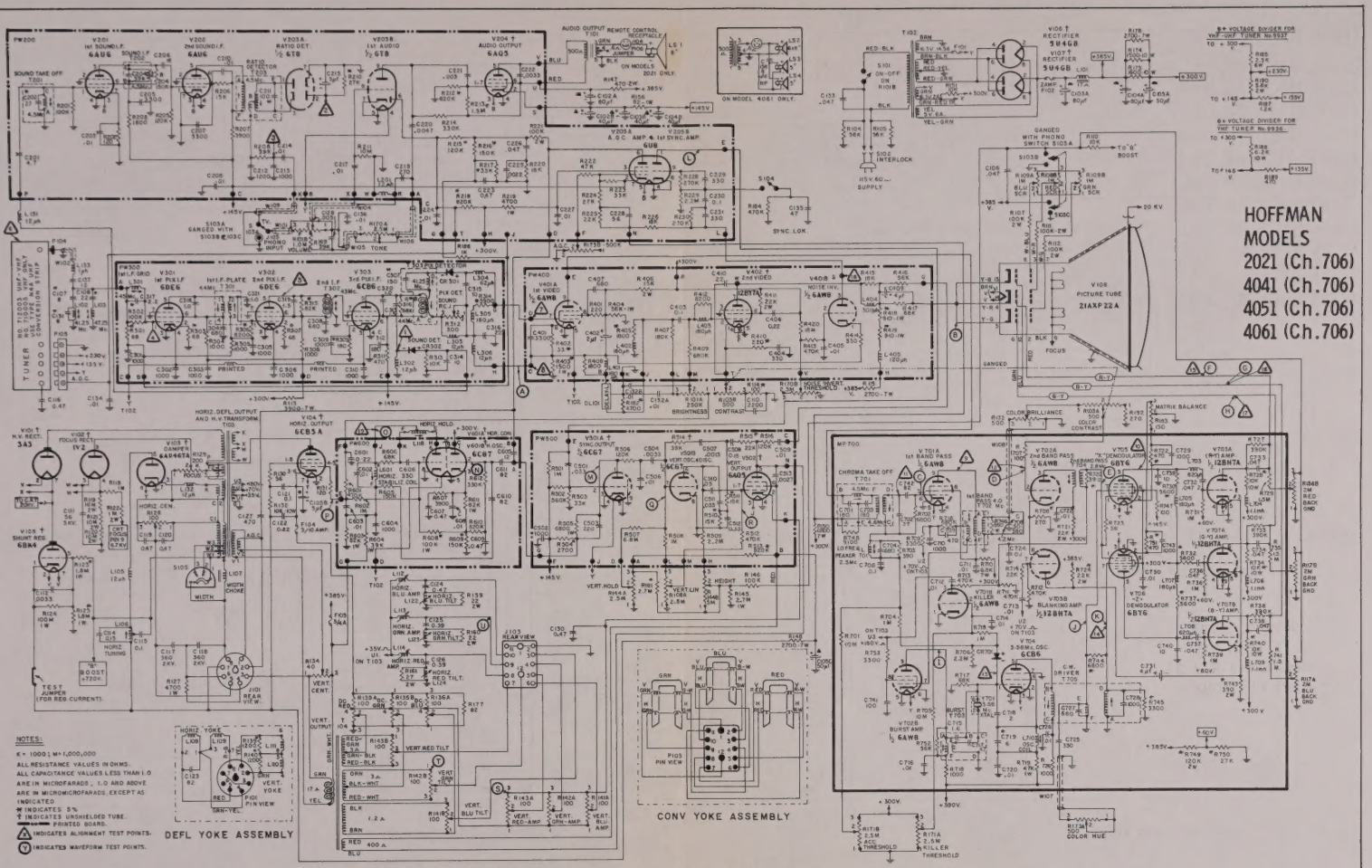
Connect the DC probe of the VTVM to C . Common to chassis.

Adjust the horizontal multivibrator trimmer (B1) for zero voltage on the VTVM. If zero can be approached but not quite reached on extreme of B1, turn the horizontal hold control SLIGHTLY off center to a point where zero can be reached.

Remove the clip lead from across the frequency coil and adjust B2 for zero voltage on the meter. Check the adjustment by switching off station and back again. The receiver should pull into horizontal sync on all stations.

FOR CHASSIS USING 5AN8 HORIZONTAL AFC

1. Turn the horizontal hold control to the center of its range. Screw the horizontal multivibrator trimmer (B1) out (decreasing the capacity) until the picture is out of sync.
2. Connect the DC probe of the VTVM to point C . Common to chassis. Measure and record the voltage.
3. Connect a clip lead across the horizontal frequency coil (L14).
4. Adjust B1 until the picture comes into sync and the VTVM reading is the same as in step 2.
5. Remove the clip lead from the horizontal frequency coil.
6. Adjust the frequency coil slug (B2) until the voltage on pin 7 of the oscillator is again the same as in step 2.
7. Check the overall alignment of the oscillator circuit by switching off channel and back again. If the adjustments have been properly made the picture will immediately pull into sync.



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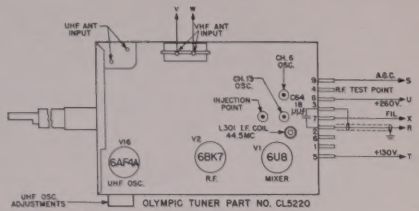
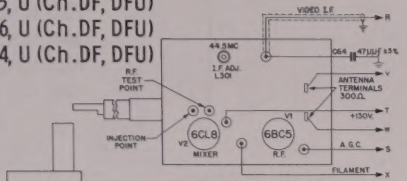
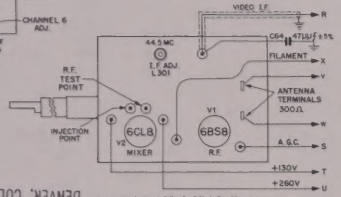
OLYMPIC MODELS
1CA70, U (Ch.DA, DAU)
1CB71, U (Ch.DB, DBU)
1CB72, U (Ch.DB, DBU)
1CB77, U (Ch.DB, DBU)
1KA80, U (Ch.DA, DAU)
1KB87, U (Ch.DB, DBU)
1KB88, U (Ch.DB, DBU)
1TA60, U (Ch.DA, DAU)
1TB61, U (Ch.DB, DBU)
4CF75, U (Ch.DF, DFU)
4CF76, U (Ch.DF, DFU)
4KF84, U (Ch.DF, DFU)



OLYMPIC TUNER PART NO. CL5220

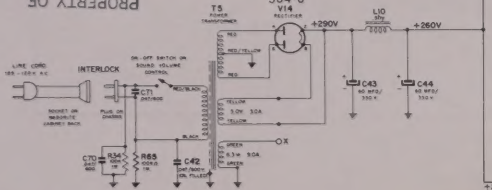


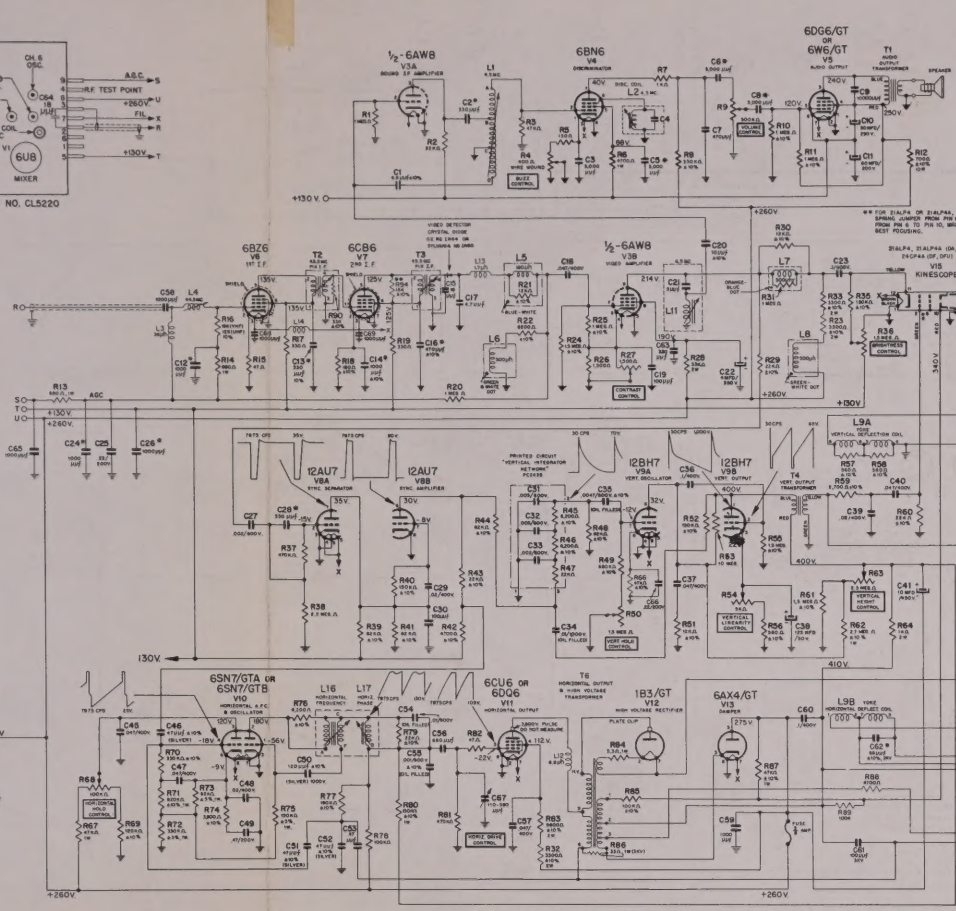
OLYMPIC TUNER PART NO. CL 4755



OLYMPIC TUNER PART NO. CL 4756

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO





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